



# TONGARIRO

## the Annual

DECEMBER 2001 VOL. 10



Department of Conservation  
*Te Papa Atawhai*





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Lake Taupo



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# Tongariro

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Cover photo: International volunteers check out the foliage browse on Lake Taupo foreshore Pohutukawa as part of an ongoing monitoring programme. (Photo: Steve Deverell)

Above: DOC staff, Ohakune 2000, Police, Ohakune Primary School, Genesis Power Ltd., and the local community plant out part of the Mangawhero Walkway in Ohakune. (Photo: Julie Whale)

Back cover: Deirdre Hutten-Andersen, an international volunteer is back in the conservancy for her third consecutive year. This summer she is working on wetland ecology. (Photo: Steve Deverell)

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# Stories in the landscape

About two months ago I was in the Rijksmuseum in Amsterdam with my grandson. The rich collection of the Dutch masters is spellbinding, gallery after gallery of finely detailed paintings. My grandson is only two years old yet we were in the Rijksmuseum for three hours. What held his attention? Certainly not the large portraits of wealthy

merchants. It was the landscapes. Probably the fact that his grandfather was able to spin stories into and out of the paintings kept his interest, a little bit of 'Where's Wally?' as we looked for cows and dogs and trees, boats and birds. Even his parents became involved as he retold his landscape stories.

This journal is also stories in the landscape. The landscape of the central North Island is one of the most richly painted in New Zealand, with volcanic ashes and ochres, verdant forest greens and ever changing lake blues. Local iwi paint cultural landscapes of mountain gods, rivalry and challenge and of peaks so sacred that one dare not gaze upon them when passing. It's a dynamic landscape very different from many others in New Zealand. Less than 2000 years ago



"Fishing in Spring"  
Vincent van Gogh

the landscape palette changed in an instant as Taupo erupted and the region was heavily brushed in pumice and ash, grey and beige.

Six years ago a rewriting of the landscape began with the eruption of Mt. Ruapehu. The effects are still being felt. This summer subtle changes occur as an embankment is constructed on Ruapehu's lower slopes to protect the Tongariro river catchment from grey lahar debris that might despoil the famed fishing of the river and lake.

There are hundreds of stories in the landscape to be told by volunteers who freely give their time each year to assist staff in carrying out their conservation duties. Some volunteer their time as part of an organised club or society. The eastern side of Ruapehu would be a carpet of impenetrable *Pinus contorta* were it not for the thousands of hours of voluntary help from clubs and societies throughout the North Island over the past forty years pulling, grubbing and cutting down this invasive pine. Others come to plant, guide visitors or teach the art of fishing. Some look after our huts or guard carparks while yet others measure, plot and record so that we can monitor the health of our forests and kiwi. All have stories to tell. Some of those stories are told in this journal. We owe them a debt of gratitude

We can't change the past but if we listen carefully to the stories in the landscape then surely we can try and make the right decisions for the future.

As we left the Rijksmuseum we passed under the fine stoned archways where a Russian brass quintet painted a resonant musical landscape, the sound of trumpet, oboe and trombone richly filling the stone enclave. Connor bobbed and swayed to the music and I couldn't help thinking of how important cultural landscapes are to young minds. But that's another story.

Dave Wakelin  
Editor

# Conservators Comments

It has been a busy and at times difficult year. The Crater Lake 'issue' has been of great interest to many in the community and engaged Harry Keys, a number of others and myself in countless hours of briefing and discussion. It is the type of management issue that arises from time to time that does not have a 'win-win' outcome. I have outlined the issue elsewhere in the journal.



Tongariro Taupo  
Conservator, Paul Green.  
(Photo: Herwi Scheltus)

2001 is the international year of the volunteer. Volunteer participation and conservation fit comfortably well together. On the one hand there is an endless amount of conservation that can be achieved if resources are available and on the other hand conservation belongs to the people and they often have a wish to be involved. The challenge is to find projects where both objectives can be met. I am pleased we have been able to recognise the efforts of volunteers in both our annual Conservation Awards and in our Volunteer Day on 5 December.

Staff were devastated in April with the sudden news of Hemi King's death. Most knew the seriousness of Hemi's medical condition but the suddenness was a great shock. Hemi was one of those people that only come along every now and again. His vision, love of life, optimism, caring has left a mark on all of us. He has been sadly missed. Hemi left a significant impression on everyone and has been sadly missed.

The Tongariro Natural History Society continues to provide strong support to the department. The society has developed a Five-year Strategic Plan outlining its commitment to the promotion of the national

park, volunteer projects, fund-raising and sponsorship. The appointment of Anja Hambach as Executive Officer is a valuable milestone for the society. The society cannot achieve all these outcomes on its own but is an ideal conduit to co-ordinate volunteer assistance. If this is to happen the society will need to have strong leadership and attract members and an executive capable of achieving the goals of the strategic plan.

A similar partnership has evolved at the National Trout Centre with the establishment of the Tongariro National Trout Centre Society. This organisation has quickly produced a business plan and marketing strategy and received a tourism grant and a Lotteries Board grant to develop the proposed Interpretive Centre. I have no doubt this will be a most valuable asset in the inter-management of the Taupo Fishery and fresh water advocacy. Many anglers have provided countless hours of their time over the years assisting kids 'fish out' days as part of this volunteer effort. The kiwi sanctuary project in Tongariro Forest focused on an intensive 1080 operation and the monitoring of chick survival in the absence of 'specific' rodent and mustelid control on 'operation nest egg' procedures. It is hoped that the results of monitoring 12 kiwi nests will help provide useful management information on the benefits of a 1080 operation as compared with previous and future year's management techniques. The use of 1080 in Tongariro Forest proved contentious from a number of quarters. It was pleasing that the operation was carried out safely in accordance with best practice techniques and that results appear very satisfactory. Three weeks after the operation monitoring tunnels detected an absence of rodents and mustelid whereas video monitoring of kiwi nests prior to the operation showed significant presence of these pests.





DOC staff volunteered their time to help complete several project Hemi Kingi had underway before his death, including a driveway and paths.  
(Photo: Herwi Scheltus)

Ecological improvement continues to occur in the Karioi Rahui but if the forest is to take a further step forward in its restoration more intensive deer control will be necessary. This will be a difficult issue for Ngati Rangi to consider as deer have been a traditional kai since their arrival.

The Conservancy's Conservation Management Strategy is now with the Minister of Conservation prior to final approval. Now that this milestone has been reached a review of the Tongariro National Park Management Plan has commenced. This will be a key project over the next two to three years.

The Whakapapa Visitor Centre redevelopment project was opened in March by the Minister of Conservation. The visitor experience has been greatly enhanced and feedback to staff has been most positive. If you haven't been to the visitor centre in the last year I urge you to pay a visit. If you are going to be in the area this summer don't forget the summer programme. This has been a feature now for at least 38 years and each year we add new challenges and excitement. The programme of 63 activities runs from 27 December through till 28 January 2002. The Whakapapa Visitor Centre can provide details and take your bookings.

We may feel the effects of the tragic events in New York on 11 September this summer with reduced numbers coming to the conservancy though I feel that with time we will recover any dip in visitor numbers as new security measures will increase safety in the air.

I have recently returned from Uluru Kata Tjuta (Ayers Rock) National Park and World Heritage Area where Jim Maniapoto and I met with staff and traditional owners in a move to strengthen partnerships between the two areas. Both are dual World Heritage sites, two out of only 23 in the world. Partnerships and networking between World Heritage and other protected areas offer tremendous benefits to all involved.

Turoa Ski Resort assets were purchased by Ruapehu Alpine Lifts in 2000 and the 2001 winter season was the first with the two ski fields under one management structure and proved to be a successful one.

In the next year staff will face a real challenge in moving towards an ecological management approach to prioritisation of conservation and in establishing new performance measures for reporting on results and outcomes of our work. These moves will help ensure better allocation of resources according to priority and more integrated management. The benefits of this type of approach can already be seen in the Tongariro/Taupo Conservancy by looking at the Karioi Rahui and kiwi sanctuary projects where this type of approach has been in place.

Finally, I would like to thank all staff, Conservation Board Members, Taupo Fishery Advisory Committee members, volunteers and associates for their assistance in a particularly busy and challenging year.

Paul Green  
Conservator

# That was the year that was

The 15th year of the Department of Conservation (DOC) is drawing to a close. The conservancy has achieved a lot in that time and especially over the last year. Much has been achieved in quiet fashion by dedicated staff, who, once the goal is reached, move on to the next project.

Many of projects have been completed with limited funding, relying heavily on the skill and resourcefulness of staff and the enormous contribution made by volunteers. Volunteers are the lifeblood of this conservancy.

The list of this year's achievements below is by no means complete.

- The Kiwi Recovery programme, sponsored by the Bank of New Zealand, has enabled practical research and management to be carried out. Locally, the Tongariro Forest Conservation Area kiwi project has provided a “flagship” for conservation. It has encouraged many individuals and organisations within the local community to start to recognise the wide range of conservation issues associated with managing our national icon.
- Operation Nest Egg (ONE), part of the national Kiwi Recovery programme, has seen dozens of kiwi eggs removed from nests in our forests, incubated and hatched in Rotorua’s Rainbow Springs Kiwi House, raised and then released back into the forest at an age where they are more able to fend for themselves against the predation of stoats. To date 24 young kiwi have been released into Tongariro Forest and 12 into the Karioi Rahui. [See article on page 59]
- For a period of about four to five years public opinion was polarised over the fate of the Kaimanawa horses. For a while the original inhabitants, the rare and endangered plants and the unique central North Island landscape, seemed to have been forgotten. Surveys put the numbers of horses at between 1700 and 1800. Annual culls continue to keep the herd at a manageable level of about 800 horses.
- No other event in the conservancy’s 15-year history attracted as much national and international media attention as the 1995-96 eruptions of Mt. Ruape-



The little digger that could.  
Repair work being undertaken  
on a section of the 42 Traverse  
in Tongariro Forest.  
(Photo: Barbara Curtis)





The Whakapapa winter fire that burned above the village and reached as close as 400m to the Skotel.  
(Photo: Jo Heath)

hu, the volcano's most active period for 50 years. Scientists were provided with a great opportunity to learn more about the behaviour of lahars (volcanic mudflows) and other volcanic hazards.

The buildup of volcanic debris on the original (pre-1995) outlet of the Crater Lake has been of primary concern to the conservancy and the government. An Assessment of Environmental Effects led the Minister of Conservation, Sandra Lee, in May 2000, to recommend the installation of a sophisticated alarm system in the Whangaehu Valley. In December of the same year she approved the construction of a bund or embankment to prevent the

overflow of a lahar into the headwaters of the Tongariro River. Work on the Alarm system commenced in October 2001. The Resource Management Consent for construction of the bund was received in November, work commences in December and both projects are due to be completed by April 2002. [See articles on page 9 and 13]

- The last thing Whakapapa staff expected in Winter was a fire callout. However a fire in mid July burned about 20 hectares of sub-alpine vegetation on both sides of the popular Taranaki Falls walk. Parts of the fire burned as close as 400 metres to the Skotel Alpine Resort. The fire burned through Kanuka, *Dracophyllum* and tussock. The cause of the fire isn't known.
- Tu Kakariki (the department's tree planting programme) continued this year even though the McDonald's 10 year sponsorship of the programme had ended. The Taupo Native Plant Nursery sponsored more than 600 native trees for planting on a Taupo District Council reserve on the Waikato River and the local McDonald's Family Restaurant Taupo has continued its association. Pupils from Taupo Intermediate School, local and regional authorities and community groups worked alongside DOC staff.
- Other Conservation Week planting programmes continued including the Native Trees in Schools and the foreshore planting of Whakaipo Bay.
- Since the formation of DOC effective possum control regimes have been carried out on over more than 60000 hectares of land under DOC management. Aerial 1080 poisoning continued this year including Tongariro Forest. Stoats in the forest have now been killed by 1080 after eating poisoned rat and possum carcasses, giving young kiwi (and other native species) a reprieve from stoat predation this breeding season. Rare plants such as Mistletoe, *Dactylanthus* and *Pittosporum turneri* have recovered as a result of such pest-control operations.
- Heather beetles have been released several sites in Tongariro National Park in an effort to control the introduced heather. Four years of intensive trials with the beetle were carried out in Britain and New Zealand before its release. Despite the exciting news last year of beetles at one site making an obvious impact on heather inspections of this and other sites do not show the dispersal hoped for. No news sites have been confirmed.



As Lord of the Rings fever sweeps through New Zealand and the world some of the tidy up from the filming of sequences in the park have recently been completed. Members of the Tongariro Natural History Society spent a cold and wet day in October among the craggy rocks near Happy Valley carrying out restoration planting of areas disturbed during the filming. The revegetation work is being paid for by the film company.

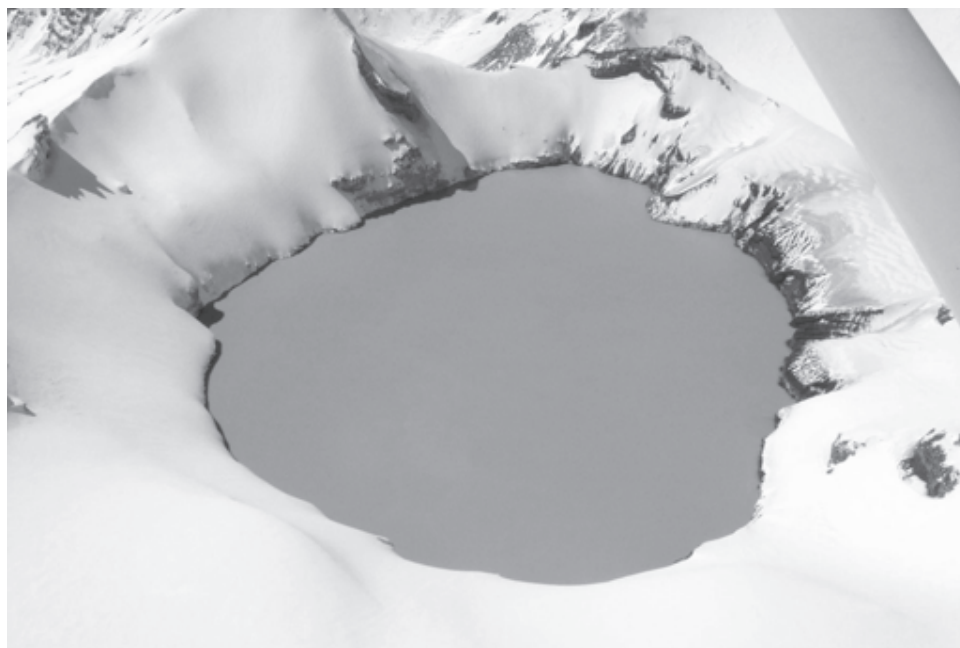
(Photo: John Newton)

Dave Wakelin  
Senior Community  
Relations Officer

- The redeveloped Whakapapa Visitor Centre was opened by the Minister of Conservation Sandra Lee in March . Changes and improvements include the combining of the two audiovisuals, exciting new displays and an enlarged and relocated reception and retail space. [See article on page 68]
- Over the years the Summer Programme of guided walks has seen changes in the way it is run and the length of the programme but still continues to be popular. A mail drop of the brochure into every mailbox in the conservancy was tried for the first time to see if this will increase participation.
- The Tongariro Taupo Conservation Awards were established in 1993 to recognise excellence in conservation and to date have been awarded to wide range of individuals, organisations and commercial groups.
- Major repair work was carried out on a section of the 42 Traverse in Tongariro Forest.
- The new visitor facilities at Huka Falls have received good support from the tourist sector. The new toilet block, part of the complex, has 'relieved' the pressure on the old inadequate facilities. The presence of volunteer staff manning the kiosk during the day has reduced theft and vandalism that was previously a major problem. [See article on page 49]
- The purchase of Turoa skifield by Ruapehu Alpine Lifts has been warmly welcomed by local business and tourist interests. The icing on the cake has been an extremely successful ski season on both fields.
- Once again teams of volunteers, largely from overseas, have descended on the conservancy to carry out intensive forest health monitoring work in the conservancy's forests. [See articles on pages 25 and 39]
- Other volunteers have assisted the full-time hut wardens in supervising Tongariro National Park's huts (Mangatepopo, Ketetahi, Oturere and Waihohonu) on the Northern Circuit Great Walk. [See article on page 24]
- Its been a long haul but progress has been made on resolving sewage disposal from the Whakapapa Ski Area, Iwikau Ski Village, and Whakapapa village.
- As we move into summer all staff have received comprehensive fire training to ensure a quick response at any time to a fire callout.
- The Conservation Management Strategy for the conservancy has been a long drawn-out affair with negotiations and legal opinions delaying its publication. It is currently with the Minister of Conservation. The CMS will serve as an extremely valuable management tool well into the next millennium.
- The Tongariro Natural History Society continued to grow in its support of Tongariro National Park and conservation in general and as an organisation and this year appointed its first full-time executive officer. [See article on page 64]
- The department's Internet Website [www.doc.govt.nz](http://www.doc.govt.nz) has been revamped and is now much more user friendly. A lot of effort has gone into establishing a more logical arrangement of information. Through 2002 expect to see an increase in local conservancy content.



# Volcano watch



The Crater Lake showing the lake outlet (dark bluff area to right of photo, under the aircraft wing strut). The lake was 56% full at the time when the photo was taken in mid October 2001.

(Photo: Dave Wakelin)

It was another quiet year for Tongariro National Park volcanoes with no eruptions. Ruapehu has not erupted for two years now although a short heating period in late February-March saw lake temperatures rise from 32° to 39°C. Lake temperatures cooled to 19°C by late August before warming slowly back to 22.4°C by 30 September. The lake went blue-green in colour from April due to a lack of convection-borne sediment and has stayed that way for what seems like longer than normal. Tremor has also been generally low and infrequent. It is now clear that Ruapehu has been considerably less active after the 1995-96 eruptions than it was after 1945. If this continues it will represent a significant departure from its previous pattern of activity, which is of course quite possible after such a major eruption. However it is far too soon to become complacent as it is more likely that there will be further activity soon.

The level of Crater Lake increased dramatically in the 2000/01 summer but levelled off in the winter. The summer rise from 35% full to 55% (equivalent to 1.8 million cubic metres) was the largest since the eruption and can be attributed to the long hot summer melting the 2000 winter snow. That snow pack clearly had a higher water equivalent than the previous two winters. Cooling lake temperatures would also have reduced evaporative losses. The lack of a level rise this winter compared to the rise during the 2000 winter may be due to the lower precipitation and colder temperatures restricting snow melt during 2001. We expect a further significant rise this summer although the amount of filling will continue to depend on climatic and lake conditions.

In late October, unusual clouds and windblown ash and dirt from upper outcrops on Ruapehu including the Whangaehu landslide area (see Tongariro Annual 1999 page 15). These may have been mistaken for recent ashfall by some people as an eruption was reported to Ohakune police.



The eastern side of Mt. Ruapehu showing the Whangaehu River valley.  
(Photo: Dave Wakelin)

Similarly the area around the northeast rim of Ngauruhoe became unusually visible this spring. GNS did not detect any increase in temperature here in late September (Brad Scott noted the NE fumaroles were still 89°C as they have been for as long as anyone can remember). Possibly the greater exposure of dark snow-free ground was caused by a relatively thin snow pack melting back faster than usual around the warm ground. However what is possibly a possibly new fumarole was seen by telescope from Taupo on 5 November, located near the normal entrance to the “crater valley” between the 1954 cone and the old northeast rim. If this

does prove to be a new feature we could call it the “Guy Fawkes fumarole”!

Tongariro had some interesting seismicity this year centred under upper Te Maari crater. Events were first detected mid year by temporary University Cambridge seismometers deployed for another research purpose. In July GNS installed two temporary seismometers near Red and Te Maari craters and pinpointed the latter as the source. They noted the events had increased in frequency to 1-2 per day and appeared to be focused in the geothermal system at two levels (Mike Haggerty and Brad Scott personal communications). Further instruments were installed for several weeks in spring to gather more data but no further increase was noted. It is proving difficult to come up with a suitable theoretical explanation for the seismicity. But the events may be important as Te Maari is the most recent Tongariro crater to erupt (in 1896). (A later date attributed to an eruption of Red Crater was proven false by David Johnston of GNS).

A moderate-sized hydrothermal eruption took place at Alum Lakes on 30 March. Trees and other vegetation were knocked over.

### **The volcano-skifield connection**

Following the eruptions of Pinatubo in 1991 and Ruapehu in 1995-1996 it is useful to follow eruptions and skifield volcanoes elsewhere. There have been no large volcanic eruptions in the tropics that might cool the atmosphere creating favourable snow falls here. Many volcanoes have been erupting or showing unrest but most of these do not appear to have a history of globally significant eruptions.

Several volcanoes with skifields have been active. On Etna lava flows surpassed constructed earth barriers and damaged tourist facilities including a cable car base station and small shop on 31 July (summer). This occurred during a lava-dominated resurgence of its long running eruption that must have had a major effect on the Sicilian ski industry. The lava lake in the crater of Villarica in Chile increased in size in June (early winter) and rose 40m in August with ash deposits and bombs observed. An increase in seismicity at Avachinski volcano in Kamchatka, Russia proceeded increased heat flow and small eruptions in October (autumn). Mudflows travelled 50 to 100m downslope possibly from a single fumarole. Its last explosive eruptions in 1991 covered the nearby town with a few millimetres of ash before lava flowed out of the crater. Minor seismicity was reported at Hood (Oregon) and Azuma (Honshu, Japan). (Information from USGS Weekly Volcanic Activity reports).

Harry Keys  
Conservancy Scientist



# Tongariro National Park: A lifetime's association

Bob Stothart is a former president of the Tongariro Natural History Society. He was a ski patroller for more than a decade and is currently a member of Serac Ski Club. He has been visiting the park regularly since 1954.

Bob Stothart examines a Tongariro Crossing warning sign at the head of the Mangatepopo Valley.

(Photo: Bob Stothart)



I first saw Ruapehu from the express train as it thundered through the night from Auckland to Wellington. My Dad woke me up and pointed out the window. There it was, ethereal, glowing, bathed in moonlight, huge, awesome, unlike anything I had seen before. I was about 10 at the time and I went back to sleep as the train rattled and bumped on its journey. Eight years later, with a group of senior scouts, I camped in the campground in mid-winter and skied on the mountain for the first time. It was a magical experience and in the process a profound and insatiable interest in Tongariro National Park was ignited.

Over the intervening years I have become a frequent visitor to the park, in summer and winter and each time I go, there is always a little thrill of anticipation about what the visit will bring. I consistently enjoy Ruapehu in winter and although I have skied there for about four decades, I am still finding new places to go and new runs to test. For me it is unsurpassed as a ski field: it is always different, season to season. The snow lies in variously sculptured ways, it changes in texture, it covers the jagged rocks differently and offers fresh challenges each season. The snow changes during the season too as it recedes up the mountain as the warmer weather comes in. Skiing on fresh snow, after being cooped up in the lodge for a few days, while the storms rage, is an incomparable thrill. After the storms the snow is closest to the silky powder that the American ski magazines keep showing us.

Skiing on the ever present Ruapehu ice, however, presents its own challenges and makes the Ruapehu skier versatile if not always stylish.

I became devoted to the park through a myriad of experiences: the crunch and squeak of crampons on snow and ice; the eye-watering sight of sunlight painting the evening sky, backlighting peak and crag; the slop of mud beneath the sole of the tramping boot; the incomparable sound of the dawn chorus or the rush of water in the next river to be crossed; dappled light, filtered through beech forest; the nearness of fantails as they flit to and fro; the exquisite pleasure of an exhilarating ski run; the stately magnificence of the tall podocarps; the purity of a fresh gentian.

I am constantly reminded about the age of the land that makes up the park and I acknowledge its enduring magnificence. The following proverb encapsulates much of that permanence:

Whata ngarongaro he tangata, toitu he whenua.

Man disappears but the land remains.

I enjoy the mountain when the blizzards rage. Secure in a warm ski lodge with a good book and plenty of food and some well-chosen wine is so unlike other experiences, especially those of the city, that it is uniquely comforting. The grunt of satisfaction on the completion of a good ski run is a feeling I want to keep repeating. The sensation of speed, the pleasure of good technique, the physical joy of exertion and the company of friends and family are but some of the



Bob Stothart spent many years as a ski patroller on the Whakapapa Ski Field. (Photo: Bob Stothart)

reasons I come back again and again. For me, skiing is more about harmony and relationship with the mountain than it is about challenge, conquest or contest. It is a unique, aesthetic, athletic experience that tempts the skier to seek perfection.

Summer visits to the park bring their own rewards. Trips in the bush or high above the bush-line are special in various ways. Colour, shape and smells flood into the senses.

Not just green but a myriad of greens or browns or terracottas. Water feeds all life forms, large and small, and contributes its own shapes, sounds and colours. Each journey brings fresh vistas, some majestic and awesome in the true sense of the word: others, on a smaller scale,

excite the eye of the observant traveller.

Over the years I have visited the park as a skier, as a day-tripper, a tourist, an informed park user and as a member of organisations which contribute to the park in various ways. My deep and abiding affection for this special place has become a genuine love of the park in all its moods, at all times of the year and in all kinds of company. I have read its history, studied its geological formations and read about the plants and animals that inhabit this unique environment.

I acknowledge the spiritual reverence for land articulated by Maori people. Such reverence is a universal human condition. People generally, locate themselves by reference to land. Inuit Indians, for example, have more than a hundred words to describe snow, its texture, colour, shape, size and so on. When I read North American Indian statements about land I am struck by the similarity of the statements with Maori beliefs. I am sure that many people in Africa, Australia and Canada, for example, hold passionate views about their spiritual connections with the land. I mention these things not to diminish or challenge Maori values but to make connections, to identify similarities and to ponder the wonder of it all.

My responses to the park landscape are initially excited by shape, the peaks, the valleys, the height, the clarity of line, the folding of hills. I then see the colours, the pastels, the subtlety of tone from white to black, from green through grey to terracotta, from blue to turquoise, yellow, ochre, russet and brown.

Such vistas stimulate our great painters and professional photographers (and amateur ones too) to capture these wonders of shape and colour in endless journeys perpetually seeking the perfect image. Other devotees of the park are stimulated to find words to express deeply felt emotions about this primal landscape. These emotions are not the spiritual capture of any one group of people anywhere. They are idiosyncratic ways of expressing deep and important feelings.

May we as a nation learn to respect, understand and protect this unique environment so that its enduring qualities remain accessible to our descendants through the coming centuries.

Bob Stothart  
Wellington

# The Crater Lake issue - a management dilemma



The Whangaehu Valley at the site of the Whangaehu Swing bridge.

The sign warns trampers of the potential danger of lahars coming down the Whangaehu River.

(Photo: Laurie Burdett)

## Background

Tongariro National Park is a dual World Heritage site for its natural and cultural properties. Tongariro was declared a national park in 1887 being the fourth oldest National Park in the world and the first to be gifted by indigenous people. The park is managed by the Department of Conservation and was declared a World Heritage site in 1990 and 1993.

Tongariro is currently facing its most testing management dilemma in its 114 year history. Other issues like the introduction of heather, development of Whakapapa and Turoa ski fields, management of Whakapapa Village, helicopter skiing and the Iwikau sewage scheme have had far smaller profiles in terms of public, cultural or political interest.

At a cultural World Heritage celebration in 1998 Bernd Von Droste, then Director of the World Heritage Centre acknowledged "Many of the World Heritage sites are threatened. Some of the threats are caused by natural factors. We are aware of the potential threat Tongariro faces due to the ash build up in the Crater Lake on Mt. Ruapehu caused by the eruptions of 1995 and 1996. Tongariro is fortunate to have a management that is sensitive to the spiritual importance of Tongariro's nature to the Maori people. The management is now searching for solutions that could prevent a disaster in the event the ash build up in the Crater Lake eventually breaches the protective natural dam. We wish the management and the traditional Maori owners every success in mitigating this threat in a manner that reflects the spiritual values of the Maori people and prevents damage."

Mt. Ruapehu and Crater Lake represent one of the world's most active and distinctive examples of volcanism. Ruapehu is one of the most frequently active compos-



ite volcanoes in the world erupting every 1-3 years on average. Volcanic processes can be seen in action and studied as a 'natural laboratory'. Crater Lake is one of two crater lakes (together with Kelut in Java) regarded as classic case studies of interaction between magmatic fluids and lake water which often produce lahars. The Crater Lake, located over the actual vent of the volcano, is especially important. The lake is partly surrounded by permanent snow and ice and is the most accessible of only two or three such active crater lakes on Earth. The volcanoes and their surrounding lahar ring plains comprise major landscape features in the central North Island. The Whangaehu Valley is probably the most active lahar path in the world and the Whangaehu outwash fan and deposits further downstream preserve records of past lahar activity over thousands of years. This is the most dynamic natural landscape in New Zealand.

Twice last century Crater Lake was completely emptied during eruptive episodes. On both occasions, 1945 and 1995, bridges were destroyed and damaged. When the lake partially emptied on the 24<sup>th</sup> December 1953 the lahar washed away a rail bridge at Tangiwai killing 151 of the 285 passengers and crew aboard an express train.

The national park/world heritage status, dynamic volcanic nature and destructive potential all help focus a great deal of public, media and political attention on the issue we have today.

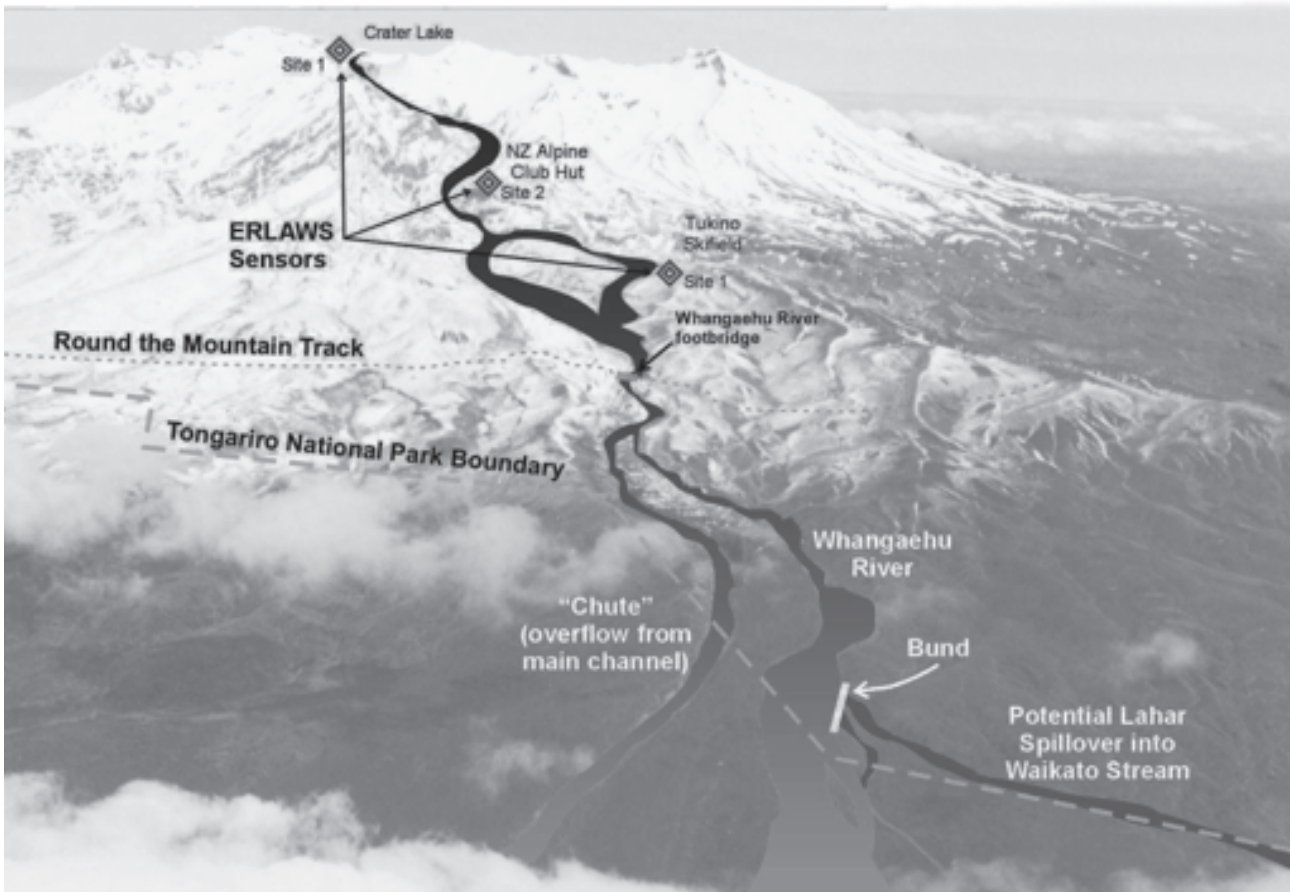
### The present situation

The eruptions of 1995 and 1996 built up a deposit almost 7 metres thick of tephra (ash, scoria and rocks) on the crater rim at the former lake outlet. (The deposits were over 15 metres thick near Pyramid Peak but there pose only a minor and less direct hazard due to potential slumping). Therefore on refilling the lake will encounter a barrier or dam of tephra and rise above the normal overflow level (2530 m). This excess water could burst out in a way similar to the 1953 producing a lahar with a peak discharge at Tangiwai possibly as much as 90% larger (the "worst-case event") than the 1953 event. Sudden collapse of the tephra dam is highly likely given the permeable and weak nature of the material but it can not be predicted at what lake level the dam will collapse.

Close monitoring and extrapolation indicate Crater Lake will become full sometime between mid 2002 and 2006. The lake is currently about 57% full after five years of refilling whereas five years after the 1945 eruption the lake was about 95% full. The difference is due to the crater being larger now than in 1951, fewer and possibly smaller meltwater streams flowing into it now due to glacial recession, and probably other factors affecting input and output of water, including volcanic activity. The volcano was more active after the 1945 eruption than after 1996 but the temperature of the lake water five years after each eruption is similar (21°C).

The Crater Lake from the east, with the outlet at about mid-centre of the photo and the Whangaehu River down which a lahar would flow.  
(Photo: Dave Wakelin)





The location of the ERLAWs sensor sites, the path a lahar would take down the Whangaehu River, the overflow channel where a major lahar could spill into the headwaters of the Waikato Stream and the location of the bund site.  
(Graphic: Dave Wakelin)

Infrastructure at risk from the potential dam-break lahar includes State Highway 1 and at least three transmission pylons of the national grid. At Tangiwai the main trunk railway bridge, State Highway 49 bridge, some power poles and possibly fibre optic cables across the bridges are similarly at risk as is the Tangiwai memorial. Downstream one small farm-bridge (Strachan's) and a small rural bridge (near Tirorangi marae) are at risk plus some sections of the Whangaehu Valley Road. Some distance below the marae the lahar will become smaller in size than normal rain floods. Other assets at risk include DOC's Whangaehu footbridge and some pine trees beside the river in Karioi Forest and downstream. Rangipo power station might need to cease production until lahar sediment cleared. There is no housing at risk.

### Assessment and mitigation

The Minister of Conservation is responsible for the management of national parks in New Zealand. Clause 4(1) of the National Park Act 1980 states "...shall have effect for the purpose of preserving in perpetuity as National Parks, for their intrinsic worth and for the benefit use and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, ecological systems or natural features so beautiful, unique or scientifically important that their preservation is in the national interest."

The Department of Conservation produced an 'Environmental and Risk Assessment for mitigation of the hazard from Ruapehu Crater Lake' in April 1999. This followed a draft Assessment of Environmental Effects (AEE) in October 1998 based

Prime Minister, Helen Clark (right) takes in the view of Mt. Ruapehu's Crater Lake during an on-site inspection of the area. (Photo: Harry Keys)



on scientific information and consultation. Forty-six submissions from local government agencies, SOEs, environmental and recreation groups, iwi, private citizens, as well as unsolicited letters and other input were all taken into account. The Minister of Conservation, Sandra Lee, requested that the department's final AEE be scientifically peer reviewed in addition to the public review.

The AEE presented 24 options in six categories that included:

- Allow lahar to occur: develop alarm and response system, improve land use planning but no engineering intervention at crater or in lahar flood zones.
- Allow lahar to occur but intervene in lahar flood zones to reduce its size and/or confine it.
- Prevent or reduce lahar by hardening or perforating tephra barrier at the crater.
- Prevent or reduce lahar by excavating a trench through the 1995-1996 tephra barrier at the crater.
- Prevent lahar and reduce lake volume by excavating trench into underlying lava at outlet.
- Prevent or reduce lahar by other options e.g. siphoning, barrier truss.

## **ERLAWS**

In May 2000 the Minister decided to action the installation of an alarm warning system and formalise the emergency management response and contingency plans. Following discussions with scientists, technicians, computer specialists and Genesis Power Ltd and a technical design review the Eastern Ruapehu Lahar Alarm and Warning System (ERLAWS) is being installed during the 2001/2002 spring and summer. ERLAWS will consist of three types of sensors at three sites down the upper Whangaehu Valley:

- Site 1 (Crater Lake outlet) - water level sensors to detect a sudden drop (> 30 cm) in lake level, a buried tripwire to detect collapse of the dam and three geophones to detect the vibration of the collapse and from lahars. (One or more of these sensors may also detect seepage through the dam before it breaks which would allow improved warning in advance of dam-break)
- Site 2 (NZ Alpine Club hut) - two geophones to detect the vibration from pass-



ing lahars

- Site 3 (near Tukino Skifield) - two geophones to detect the vibration from passing lahars.

Data from these sensors will be telemetered through dual pathways to the Genesis control room at Tokaanu Power Station, analysed and monitored on an independent computer (and backup) mirrored on the Genesis SCADA system. When incoming data exceeds pre-set thresholds an alarm will automatically be sent via pagers to police, Ruapehu District Council staff and duty scientists who will then respond following predetermined plans. There will be almost two hours time available to close the Tangiwai road bridge and more for sites downstream of there.

Installation of ERLAWS started on 30 October with site 3 preparation and the first equipment was placed there on 9 November. Sites 2 and 1 will be installed in January to February along with modifications to Dome Shelter and installation of additional radio equipment and batteries there. Thereafter the system will be commissioned and later integrated with lahar sensors operated by Genesis. The police and council are developing the primary response plan and will be trialling it before Christmas. The whole system will be tested in a major civil defence exercise in April 2002.

DOC staff prepare the ground for the installation of the first ERLAWS sensor equipment at Tukino Ski Field. The Whangaehu gorge is in the background.  
(Photo: Harry Keys)

## Embankment

In December 2002 the Minister also requested that the Tongariro National Park Management Plan be amended to permit the construction of a 'bund' or embankment to prevent overflow from the Whangaehu River into the Tongariro catchment.

This embankment will be located just inside the national park boundary near the head of the Whangaehu outwash fan. This site is not as sensitive as that at the Crater Lake itself. The structure will be about 285 metres long, up to 4.2 metres high and about 20 metres wide composed of gravel, ash and boulders bulldozed from the lahar flood plain (not the current bed of the river). The material will be compacted then armoured in front and on top with a layer up to 2 metres thick of well-graded boulders up to 1.5 metres in diameter. The bund design has also been peer reviewed.

Environment Waikato granted the resource consent for the embankment on 14 November. Construction will start in December and is expected to be complete by late February 2002.

The primary aim of the bund is to increase public safety. It will reduce risks to people crossing the Waikato Stream bridge and culvert area on State Highway 1 as well protect public safety in the Tongariro River. Its secondary purpose is to protect the aquatic environment of the Tongariro River and Lake Taupo. It will have a negligible to small effect on the main part of the lahar down the Whangaehu River. According to lahar hydrological

modelling the maximum spill over prevented by the bund is only about 7% which is very small compared to the non-spilling portion and much smaller than uncer-



tainties in calculated lahar parameters. For example it would increase the depth of the worst-case lahar at Tangiwai by about 3cm (0.5%), much less than the heights of waves on the lahar surface.

### **Further action and decisions**

The Minister has not ruled out intervention at Crater Lake but is monitoring progress with the alarm system and construction of the bund together with monitoring the refilling of the lake. DOC at the Minister's request has convened a scientific advisory panel of geologists (including lahar specialists) and civil engineers to provide her with independent advice. More information will also be made available to the public as the lake becomes full, including warnings at vulnerable places.

Public opponents of the measures taken have included district and regional councils who are responsible for operating local utilities such as roads, civil defence and regional planning. They are not responsible for the State Highway or railway bridges or power pylons most at risk. They have argued that accepting any risk that can be avoided is not appropriate and that the Minister is passing liability for risk and damage of infrastructure outside the national park boundary on to them. However, they, along with Transit, Genesis and Transpower, other councils involved and Winstones Pulp International are assisting the department with funding the mitigation measures.

A fundamental question is whether interference with natural, cultural and scientific values of a World Heritage site should proceed simply because there is a 'residual' risk. The risk to life is low because of the proposed warning system and construction of a bund but cannot be absolutely mitigated. If a decision is made to interfere by carrying out engineering work at Crater Lake will it be expected that we will continue such direct interference with other volcanic risks in Tongariro National Park?

Would it not be an appropriate management action to use the knowledge of lahars to place infrastructure such as roads, rail and power lines at sites less likely to be at risk or to design them in ways to make them safe? This is what Ruapehu Alpine Lifts has done at Whakapapa Skifield and what TranzRail believe has been done with their rail bridge at Tangiwai.

The Minister of Conservation is faced with a contentious management and political decision that cannot please everyone!

Paul Green and Harry Keys  
Tongariro/Taupo  
Conservancy  
Department of  
Conservation

# Sacred Mountains

In 1994 the World Heritage Committee adopted a global strategy for a balanced and representative World Heritage List. Its aim was to ensure that the List reflected the world's cultural and natural diversity of outstanding universal value. Following the publication of a Regional Action Plan for the Asian Region the Government of

Japan organised a UNESCO Thematic Expert Meeting on Sacred Mountains in the Asia-Pacific Region. The meeting was held in Japan in September 2001.

The participants of the meeting acknowledged that there exist a great variety of landscapes that are representative of the combined works of nature and humankind. These landscapes express a long and intimate relationship between peoples and their natural environment. Certain places, associated in the minds of the communities with powerful beliefs and artistic and traditional customs, embody an exceptional spiritual relationship between people and nature. This is in particular the case with

sacred mountain sites. At the same time such mountain sites demonstrate cultural diversity and are often centres of significant biological diversity. Sacred mountains also testify to the creative genius, socio-economic development and the imaginative and spiritual vitality of humanity. Sacred mountains are part of our collective identity.

## Identification of the character, significance and values of sacred mountains

Before proceeding onto determining the criteria for sacred mountains the conference discussed and defined "sacred" as a manifestation or expression of a deeper reality that inspires reverence and awe, which gives meaning and vitality to people's lives. They defined the sacred mountain as a significant natural elevation where the spiritual and physical unite.

In accepting that sacred mountains traverse a wide variety of values, natural and physical, they considered that Asia-Pacific sacred mountain sites may be categorized within the following groups:

- (a) the mountain itself is considered sacred;
- (b) the mountain has sacred associations;
- (c) the mountain has sacred areas, places, objects;
- (d) the mountain inspires sacred rituals and practices.

Sacred mountains are seen as being incredibly diverse. The physical characteristics of a mountain are significant. Mountains can be seen as a centre of the cosmos or the world, paradise; as representing power, deity or deities or an identity of a nation or a group of people. They may be a place of worship, where spirits or ancestors reside or pass through, a place for seclusion or healing source of inspiration, power or healing. Various cultures place importance on how high or low a mountain is, while some cultures don't, underscoring that none of these themes

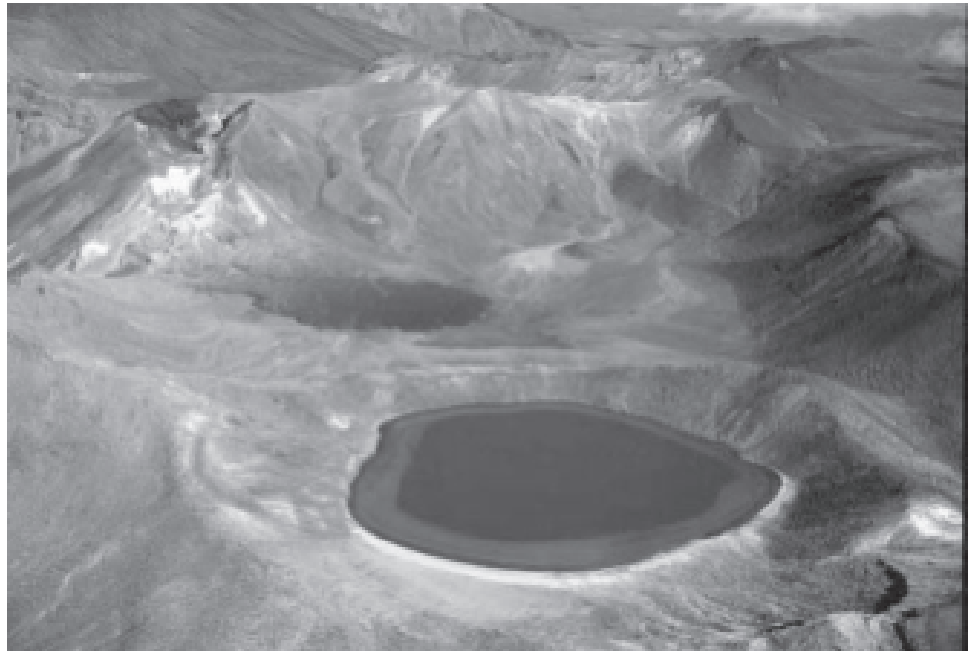
The power of such a mountain is so great and yet so subtle that, without compulsion, people are drawn to it from near and far, as if by the force of some invisible magnet; and they will undergo untold hardships and privations in their inexplicable urge to approach and to worship the centre of this sacred power. Nobody has conferred the title of sacredness on such a mountain, and yet everybody recognizes it; nobody has to defend its claim, because nobody doubts it; nobody has to organize its worship, because people are overwhelmed by the mere presence of such a mountain and cannot express their feelings other than by worship.

Lama Anagarika Govinda

2002 is the UNESCO International Year of the Mountain. The Department of Conservation has chosen mountains as the theme for Conservation Week 2002. A number of events marking the year are planned.



Tongariro is more than one named peak. It is a massif of volcanic vents including Red Crater, Te Maari, Ketetahi Hot Springs and Ngauruhoe and the explosion craters Blue and Emerald Lakes.  
(Photo: Mountain Air)



take greater priority than others.

It is not always possible to separate the natural and cultural values, which in many cases are fused. Despite the fact that sacred mountain properties may hold heritage value at national, regional (within a nation), local or even family level any sacred mountain property nominated as World Heritage should be of outstanding universal value.

### **Cultural Heritage Values**

Associative cultural landscapes are seen as particularly relevant to sacred mountains. Tongariro National Park was the first World Heritage site in the world to be inscribed on the World Heritage List for its associative cultural landscapes.

Cultural heritage may include both tangible or intangible heritage values.

#### **Tangible Cultural Heritage Values**

The presence of tangible evidence to measure the cultural human-made tangible heritage values may take the form of bridges, sculptures, monuments, caves (human made), monasteries, shrines, cave / wall paintings, cemeteries and tombs, petroglyphs, temples, refuges, historic pilgrimage, vistas, viewpoints, routes and/or paths.

#### **Intangible Cultural Heritage Values**

When the above list is examined it can be seen Tongariro National Park lacks tangible cultural values, except maybe on Tongariro (Ngati Tuwharetoa) for vista and viewpoints. Tongariro clearly possesses intangible values. Anecdotal evidence of local Maori indicate strong cultural links, including first ascents and mountain-side (Ngati Tuwharetoa) and crater lake (Ngati Rangi) burials. Intangible values identified at the conference include

**CONTINUITY** of oral or performing traditions or festivals related to the use and/or reverence of the sacred mountain, communication with the deity(ies) associated with the sacred mountain;

FAME	how well the sacred mountain is known or visited;
IDENTITY	the sacred mountain represents a nation, religion, groups of people;
MANIFESTATION	of centre of the cosmos, deity(ies), paradise, spirit(s), universe, power;
MYTH	there are myths related to the creation or presence or importance of the sacred mountain;
PRACTICE	activities of ascetic practice, enlightenment, meditation, pilgrimage, purification, teachings, reverence to god(s), worship of ancestors;
PRESENCE	permanently or temporarily of a deity or deities or a holy person(s);
SOURCE	for healing, inspiration.

Ideally the existence of intangible cultural heritage values should be established through physical evidence such as documentation (codes of conduct, texts, records of rites, etc). It was recognised that in some cultural traditions physical documentation or evidence of sacred mountains is not permitted and therefore is not available in physical form.

### **Additional Considerations**

When determining the value of sacred mountain properties the following should also be considered:

- (a) How long the mountain has been in use as a sacred site and how many traditions are represented.
- (b) Some sacred mountains are intentionally kept 'secret' to protect the sacred areas as well as the population, which utilises the sacred areas within the mountain.
- (c) The significance of a fossil or relic sacred mountain should be well established through documentation or other physical evidence. Only thereafter can an assessment of the potential universal value of the sacred mountain be made.
- (d) There exist fossil or relic sacred mountains, which have been reutilised by a group or groups of people who are increasing the cultural stratification of the sacred mountain. In some cases, belief systems attached to a sacred mountain may remain, or disappear, or reappear. It was noted that it is necessary to place due respect to existing cultural layers of significance.
- (e) Some sacred mountain properties may consist of several mountains or areas, whose interrelationship should be recognized.

### **Integrity and authenticity of sacred mountain properties**

The participants underlined that "integrity" in the context of sacred mountains as cultural landscapes implies a balanced state of ecological systems, aesthetic, cultural, religious or artistic associations. For protecting the integrity of sacred mountains evolving cultural practices, including traditional ecological knowledge, may need to be taken into account. The need for an enhanced appreciation of the interface between ecology and culture as a dynamic basis for maintaining the integrity of a cultural landscape should not be underestimated.



Ruapehu, according to Maori tradition, was the first mountain of the North Island, placed there to have a calming influence on Te Ika a Maui.  
(Photo: Destination Lake Taupo)

### **Recommendations for the identification of the character, significance, and values of sacred mountains**

Each State Party in the Asia-Pacific Region should re-examine the sacred mountain properties and their heritage values located in their territory utilising the indicators listed above.

State Parties in the Asia-Pacific Region should share comparative analysis of sacred mountains within the region, as this exchange of information would facilitate the harmonization of the tentative lists in the Region. Networking and exchange of information should be encouraged. The visit of Conservator Paul

Green and Kaupapa Atawhai Manager Jim Maniapoto to Uluru Kata Tjuta this year is an example of how countries can work together.

From the conference came the recommendation for a comprehensive assessment of all cultural criteria for sacred mountains as cultural landscapes. Moreover, it was recognized that within the context of sacred mountains, the current wording of cultural heritage criterion (vi) is not satisfactory as some sites may only qualify through intangible values linked to the natural environment. Therefore, it is recommended that cultural heritage criterion (vi) be amended as follows:

“This criterion should justify inclusion in the List only in exceptional circumstances and preferably in conjunction with other criteria, cultural or natural.”

This inclusion is interesting because it implies that Tongariro National Park may not have received the associative cultural status on its own without the already existing natural landscapes value accorded several years earlier.

It was recommended that a review of the associative and other cultural values of existing natural World Heritage sites in the region be conducted as it would be useful for undertaking comparative analyses of sacred mountains in the Asia-Pacific region. States Parties with existing World Heritage mountain properties were urged to review associated cultural heritage values. Upon assessing their significance, such States Parties may consider renominating these properties under cultural criteria.

I believe the dual status of Tongariro National Park is secure. It does however raise the question though of whether, following a review, Te Wahipounamu World Heritage Area should be renominated for associative cultural status. Aoraki (Mt. Cook) is part of Te Wahipounamu and is revered by Ngai Tahu and clearly possesses intangible cultural values.

### **Co-operation of stakeholders**

Co-operation between the primary stakeholders is seen as essential within the management process. The primary stakeholders could consist of local community or indigenous citizens, owners, custodians, guardians, religious groups, pilgrims, concerned authorities, etc. The importance of support, recognition, awareness of the heritage values and the need for sustainable management of sacred mountains at a high level within the government was also underlined.



Clarification of ownership of a sacred mountain and all the components which provide evidence of the heritage values of the sacred mountain would clearly define responsibilities for conserving, maintaining and managing the sacred mountain and its heritage values.

Activities to increase the awareness and to promote the involvement of younger generation stakeholders, the future guardians of our common heritage, could positively impact upon the long-term conservation process of sacred mountains.

The practices of local populations may be essential in conserving and managing the significant heritage values of sacred mountains.

The meeting acknowledged the great challenges that concerned authorities and stakeholders face in the conservation and management of sacred mountain areas.

Local, regional, and central authorities would need to strengthen legal and administrative mechanisms to increase the protection of the fragile heritage values. This may be achieved by applying an integrated planning approach, giving due emphasis to socio-economic development.

Regular review and updating of management plans applicable to sacred mountains, in particular for jointly managed properties was essential.

### **Pilgrimage and tourism management**

Some sacred mountains may be adversely affected by pilgrimage and tourism activities. Such activities though may also provide economic benefits to local communities.

Concerned authorities and site managers would be strongly encouraged to integrate heritage protection within the general planning policy for sacred mountain areas, particularly placing emphasis on the development of the local and regional communities.

Appreciation and reverence for the sacred mountain might increase if guidelines for visiting sacred mountains were integrated into management plans and training programmes for tour operators and guides . For example, inappropriate access to certain areas of a sacred mountain may threaten its heritage values, offend the citizens who respect and follow beliefs associated with the mountain, and furthermore threaten the safety of all visitors. In Australia the Aborigine for whom Uluru Kuta Tjata World Heritage Area is sacred have requested that visitors do not climb to the top of Uluru. Ngai Tahu have asked climbers not to stand on the top of Aoraki as this is seen as standing on the head of their gods.

The participants highlighted the following principles applicable to sacred mountains:

- tourism can be a vehicle for cultural exchange and conservation, especially in the conservation, presentation and utilization of pilgrimage routes, itineraries, or paths;
- sound tourism planning can ensure that the visitor experience is satisfying and also respects cultural practices;
- host communities and custodians of sacred mountains should be involved in the tourism planning process to ensure that tourism revenue and activities benefit the heritage, local communities, and custodians; and tourism programmes should protect natural and cultural heritage values of sacred mountains.

Dave Wakelin  
adapted from  
Conclusions and Recommendations of the  
UNESCO Thematic Expert  
Meeting on Asia Pacific  
Sacred Mountains  
(5-10 September 2001,  
Wakayama City, Japan)

# Volunteer hut wardens

Volunteers have played a big part in the hut warden operation over the years. When I first came to New Zealand in 1990 I was a volunteer hut warden for three months. Many have followed since and for some they have used it as a stepping stone to working for the department.



Oturere Hut, at the mouth of the moonscape-like Outurere Valley, is one of a series of huts linking tracks around Ruapehu, Tongariro and Ngauruhoe. (Photo: Jimmy Johnson)

I took over the hut warden coordinators role in 1995 and since then have trained nearly 100 hut wardens of which over 80% have been volunteers. It's perhaps fitting to reach that milestone in the International Year of the Volunteer. A reunion is planned for early next year and already two overseas volunteers are using this as a good reason to return to New Zealand.

The policy for the selection of hut wardens has remained the same throughout. Local volunteers get priority, then other New Zealanders and finally overseas visitors. In reality not many New Zealanders apply although last season proved the exception. Over the years nationalities have included 26 New Zealanders, 14 Britains, 13 Americans, 6 Canadians, 5 Germans and 3 Swiss. Austrians, Belgians, Dutch, French, Japanese, Israelis, Swedes and Australians made up the rest. Collectively they have contributed more than 2500 days - almost seven years of work.

The modern day hut warden volunteer can expect to be well trained and informed with good two-way communications. Three other conservancies have modelled their training system on ours. But that does not make it a finished product. We are constantly changing to meet new training needs and to keep up with ever changing practices. All hut wardens are told that their primary job is to help people enjoy this park (in the right way) and you only need flick through the hut log books to see that the majority of visitors do appreciate their efforts.

Having volunteers has proved to be very worthwhile not only for the volunteers but also for us. We have had many overseas rangers work here and we have been able to learn from their ideas and experiences. Also it has given me the opportunity to visit volunteers back in their own countries. I have had the royal tour around three parks in the US, one in Canada and one in Germany. The opportunity to work as a volunteer in Denali National Park in Alaska and the Kaiserstuhl National Park in Germany has been extremely rewarding. The Denali connection is particularly strong and we have had five Denali Rangers as volunteers here since 1995. I keep in regular contact with Denali and send them DOC publications. Among so many volunteers we have certainly had some characters. I still keep in touch with more than half. Most will remember their Tongariro experience as a treasured memory that will live on and we remember all the good times spent with them and thank them for their time and dedication.

Jimmy Johnson  
Hut Warden Co-ordinator

# Volunteer participation in the conservancy's survey and monitoring programme

Over the past several years, Tongariro/Taupo Conservancy has utilised an increasing amount of volunteer assistance in many aspects of its forest health monitoring programme. The direct benefit for the Department of Conservation lies largely in reducing the costs of conducting surveys that would otherwise have entailed a prohibitive cost. However, other gains are more difficult to define, such as the enthusiasm and shared skills that volunteers bring with them.

The goals of the volunteer programme for the conservancy and DOC nationally are:

- To provide volunteer opportunities so the community can assist in the conservation of New Zealand's natural and historic resources.
- To provide new opportunities for people to safely experience the natural and historic environment and to become more sensitive to those values.
- To support and strengthen links between the department and:
  - Tangata whenua.
  - Conservation and recreation groups.
  - Community in general.
- To enable conservation tasks that otherwise would not have been done to be completed through the assistance of volunteers.
- To enable the department to benefit from the shared expertise of skilled volunteers.

Volunteer assistance in the survey and monitoring programme primarily addresses the last two of these stated goals. The focus of surveys conducted by this team is to assess the impacts of introduced browsing animals on indigenous plant and



Right: Volunteers Tia Lahteenmaki, Hanna Lindblom, Marie Tonnberg and Janette Baarman from the conservancy survey and monitoring programme measuring health and browse indices of seedlings of deer palatable species in deer impact plots at the Karioi Rahui.  
(Photo: Steve Deverell)



animal species, forest composition and to monitor the benefits of pest control management. This work requires people with the necessary ecology/botany related academic qualifications and proven field skills driven by the motivation and interest to commit to at least three months of often tedious, repetitive work in difficult conditions.

A significant proportion (70-80%) of these volunteers over the past five years have been from overseas. Most foreign volunteers are graduates in botany, ecological studies, forestry or related disciplines, who wish to broaden their field experience, with New Zealand being noted for its conservation efforts. Many of these volunteers have advanced plant taxonomy skills, which soon offset any slight disadvantage they might have facing a largely unfamiliar flora.

New Zealand volunteers have also generally been students or graduates in ecology related fields. For many it is an opportunity to gain first-hand experience with future employment opportunities, or help in deciding a direction of study. For graduates it is often the first step beyond university where there is a chance to test, enhance and display skills and qualities with a view to employment at some level. A high proportion of the New Zealand volunteers that have participated in the programme have gone on to be employed as Department of Conservation staff in similar roles throughout the country. Similarly, many of our overseas volunteers have shown that their experience in working with the Department of Conservation in New Zealand was of value in broadening their understanding of a range of environmental issues, conservation efforts and methods.

Although participating on a voluntary basis, volunteers are treated similarly to permanent DOC staff with similar expectations of work performance. Data collected by the Survey and Monitoring programme are the basis for pest management decisions and a high standard of fieldwork and resultant analysis to support these decisions is required.

The contributions made by volunteers participating in the monitoring programme covers all aspects of the work. The most fundamental one, the gathering of raw data, is often repetitive and tedious. Every day spent in the field collecting data, is more than balanced by many more days in the office, in the equally repetitive task of the entry of information into data storage and analysis systems, and ultimately, the presentation of results. Throughout this process, the skills, knowledge and capabilities of individual volunteers, and the value of their contribution to this process is apparent. Individual volunteers can bring with them the training and ability to produce field guides to assist in the initial collection of high quality data, the familiarity with many computing and analysis processes to manipulate this data, and the capability to report these results. And in contributing all of these things, not only do they produce results (numbers of vegetation plots re-measured, mistletoe plants located and monitored, graphs and reports produced), but they impart their knowledge and expertise to everyone else involved.

### **Why use volunteers?**

The most quantifiable reason is one of economics, where work, which would probably have entailed a prohibitive cost, can be conducted with volunteer assistance. At the risk of turning highly qualified, motivated people into “vegetation plot and data entry fodder”, the fact remains that much of this work is very labour-intensive and time-consuming. It is very difficult to place a monetary value on outcomes



Above: Marie Tonnberg assessing canopy foliage cover and levels of possum browse on pohutukawa at Kaipo Bay (November 2001). Subjectively assessed data requires particular attention and training in methodology to maintain consistency in data between observers.  
(Photo: Steve Deverell)

produced because of the wide ranging, flexible work structure. In the 1998/99 field season, over 160 permanent vegetation plots (20 x 20 m) were established or re-measured by the Tongariro/Taupo Conservancy monitoring team. The use of volunteers supported by up to three permanent and/or contract staff resulted in a per plot cost of approximately \$300-400. This is between a quarter to a half of the cost/plot that more conventional means (permanent/contract staff) would entail. This 1999 cost also includes other work carried out by volunteers that is not possible to evaluate on an outcome basis. Expenditure includes the reimbursement of food costs, accommodation, field

equipment and transport costs.

### **How accurate is data collected by volunteer staff?**

A survey is a systematic observation, count or measurement of selected characteristics of a specific population at a specific location. Monitoring can be defined as the measurement of changes that occur in the same or other characteristics in a population at the same location over a defined period by analysis of data from successive surveys. Conclusions determined from these surveys are based on the premise that the original raw data is of a high enough quality to support them.

One of the primary concerns expressed by many people is that this assurance of data quality is compromised by the use of volunteers.

Accuracy depends on the botanical knowledge, skill level and enthusiasm of the individual to learn and not whether or not (or how much) a person is being rewarded financially. A number of volunteers in the conservancy monitoring programme have shown exceptional plant skills (as the conservancy botanist would attest to), ensuring a high standard of data obtained and enhancing the skill level of both fellow volunteers and permanent staff. The accuracy of data collected by volunteers in surveys conducted over the past three years in the Tongariro/Taupo Conservancy compares very favourably with previous and contemporary surveys undertaken by paid staff. There is no doubt that short-term consistency and accuracy suffers to a small degree. However, this can be alleviated as much as possible by a careful distribution of experience.

The correct identification of species, the elimination of simple data collection, recording and entry errors is not guaranteed, or necessarily improved, by payment. Difficulties with species identification lie primarily at the herbaceous species level, something not unique to volunteers, whether from overseas or New Zealand. On the contrary, accuracy levels of species identification achieved by volunteers trained and qualified in systematic botany commonly surpass that of surveys conducted by more conventional staff sources.

In a recent re-measurement of permanent sample plots in the Kaimanawa and Ka-



Above: Hanna Lindblom and Marie Tonnberg measuring the stem diameter of trees within standard 20 x 20m vegetation plots at the Karioi Rahui (November 2001). This data is used in conjunction with information from deer impact plots to describe stand occupancy and regenerative potential. (Photo: Steve Deverell)

weka Forest Parks, an apparent substantial increase in species richness was recorded between the original surveys and the re-measurement 20 years later. However this was due to the aggregation of many taxa at the species level in the original survey, whereas the re-measurement recorded a more detailed level of species identification. For instance, eight individual species of Hymenophyllum (filmy ferns) recorded in the re-measurement of these plots were described solely as a single aggregated species Hymenophyllum spp. in the original survey.

From the point of view of botanical value it is necessary to be as accurate and specific as possible. To determine species diversity and distribution it is obviously important to be able to do this. Detail in data achieved by teams of staff and volunteers of the Tongariro/Taupo monitoring team is more than adequate for this to be achieved.

In the re-measurement or establishment of permanent vegetation plots there is a variety of roles that require varying degrees of expertise. Overstorey measurement is very effective with two or three people, enabling the training of new team members while they carry out a necessary, productive task. Skill levels are enhanced and degrees of accuracy

ensured by a balanced distribution of experience and knowledge. Care is also needed because of significant changes that could result from inaccurate data (for instance, changes in basal area due to faulty plot layout or tagged trees not measured). However, from experience of previous surveys, paid, longer-term staff are also not immune from such errors.

### **Subjectively assessed data**

Close attention is paid to the potential variability of data obtained by volunteers when subjectively assessed data is involved, e.g. when using the Foliar Browse Index method (Payton et al. 1997) for assessing possum impacts. Recognition of browse, and differentiating between possum and insect damage or fungal attack is often difficult, frustrating and dependent on familiarity with the variations of apparent browse between species. Initially, a great deal of time is spent on recognition of browse and foliage density scoring calibration. It has been shown that trained observers assessing the foliage cover of trees score within 10% of cover, 85% of the time. Using this figure as a level of desired consistency, regular audits are conducted to maintain this level and prevent the gradual 'creeping' of scores.

### **Effective investment of staff resources**

Over the past five years, volunteer numbers in the Tongariro/Taupo Conservancy monitoring programme have increased from a total of six in 1996, to 16 in 2001/02 with levels reaching over 30 in the 1999 field season. This demands a great deal of infrastructure support, from accommodation, transport and field equipment



availability to immigration matters.

An important factor in the equation of the value of volunteers is the level of investment in volunteer training and support required by long-term staff. There is undoubtedly a huge investment of time and energy by longer-term staff in the training and supervision of volunteers. Depending on the number of volunteers, their skills and experience, the length of stay, and the frequency of new arrivals, there is a need for some level of instruction in field skills, monitoring techniques, plant identification, data manipulation and analysis. However, this can be instructive for all involved, as questions asked often lead to a refinement or clarification of methods.

To become familiar with the New Zealand flora and the survey techniques employed requires a commitment by the volunteer of at least three months. The level and extent of training varies considerably with the skills and qualities of the personnel. The time for those skills to be attained also varies with the individual, but well within the three-month minimum stay, this investment of training has been repaid in the work produced. Depending on the individual skills and experience of a volunteer, a new volunteer can become a productive member of a monitoring team within several days.

## **Options for monitoring staff requirements. Pros and cons of volunteer assistance.**

### **1. Permanent monitoring staff**

Staffing levels are often unable to meet the demands of the monitoring work at hand. The labour intensiveness of collecting raw information often precludes the undertaking of many programmes due to staff and funding constraints. However, increasing levels of accuracy and reliability of data and monitoring methods can be achieved by using specialist permanent staff.

### **2. Area staff**

Obtaining Area staff involvement on a long term basis can be difficult but is valuable way to broaden and enhance the skills-base of the staff. Infrequent involvement means that the consistency and accuracy concerns that are an issue with volunteer assistance in monitoring programmes are even more evident and valid.

### **3. Short-term contract staff**

This can provide an effective compromise that adapts to fluctuations in funding. On the basis of the proportion of paid staff (permanent and temporary) to volunteers in surveys conducted in Tongariro/Taupo Conservancy over the previous three years, a doubling in survey costs can be expected by the full use of short-term contract staff.

### **4. Volunteers**

There are pros and cons in using volunteers on monitoring projects:

Pros

- Economic feasibility of conducting work that would otherwise not be carried

out due to funding constraints.

- Input of highly qualified, skilled and knowledgeable people.
- High quality of data. Skilled, trained volunteers can obtain effectively accurate data, equalling, and often surpassing that collected by other means.
- A group of enthusiastic, highly motivated people generates a stimulating working environment.

#### Cons

- A highly mobile workforce. Flexibility is needed in scheduling work. Declared commitments of stay can vary enormously and be quite imprecise e.g. three to six months. A positive way of looking at this is that it teaches work planning flexibility and day-to-day planning skills.
- Continual process of training-depending on numbers of volunteers, length of stay and pulses of recruitment.
- Accuracy of data concerns. Potentially less consistent than data from long-term, experienced staff.

The Community Involvement/Volunteer Activities Standard Operating Procedure (SOP) describes the limits on volunteers replacing/supplanting staff. However, the question can be raised: Does the use of volunteer assistance create an attitude of reliance upon volunteers at the expense of confronting the need to develop a skilled, experienced staff level? Experienced, long-term staff are essential in a field that deals with the measurement of changes and long-term results, but there is definitely a place for volunteers in many aspects of the department's monitoring programmes, for the benefit of both.

Monitoring measures change. Standardisation and consistency (stability) in the survey method and indices of measurement are essential but, what level of accuracy is feasible/adequate/desired, and when is a potentially slightly less robust result still preferable to no result at all (i.e. if the survey was not conducted due to lack of sufficient funding)? The level of investment needed by permanent staff is returned many times over by the results ultimately produced by volunteers. Our experience over the past five years has shown that the quality of data, and the ultimate results of this data are in fact enhanced by the assistance of very highly skilled, knowledgeable, and equally importantly, very motivated people.

Volunteers bring these attributes, in most cases half way around the world, because they wish to learn, about and contribute to conservation issues and efforts in a country which is held in high regard for these efforts. In doing so, the department benefits materially in the accomplishment of valuable work perhaps unable to have been done without them, but also in so many intangible ways, the sharing of their skills and knowledge, and perhaps most importantly, their enthusiasm and dedication to our work.

Steve Deverell  
Forest Health Monitoring  
Volunteer Supervisor

Right: Janette Baarman and Marie Tonnberg tagging and measuring individual seedlings of red and silver beech at a site of dense regeneration in a recent canopy gap at the Karioio Rahui (November 2001).  
(Photo: Steve Deverell)



# Tourism - a community thing



Right: Early morning in late November and another Great Lake Cycle Challenge is underway. This and other major Taupo tourist attractions are only possible because of hundreds of volunteers who give their time freely and immense community support.  
(Cycle Challenge Trust)

As I write this the Great Lake Cycle Challenge has finished its 25th jubilee event with more than 6600 cyclists taking part. I was one of hundreds of volunteers who manned drinks stations, loaded bike racks, marshalled road corners, took registrations, made up nearly 7000 packs, stuck labels on the same number of wine bottles, helped with transitions for relay riders, and generally encouraged all who took part. The list of jobs goes on and on.

Once it was over there was a widespread feeling of euphoria not only among the athletes but certainly among the helpers. Once again Taupo had achieved the impossible. About 20000 supporters and cyclists came to Taupo and by the time the weekend was over had injected an estimated \$8 million into the local economy.

This is the second largest event in the country outside the Auckland Round the Bays run. However there is no doubt that in terms of organisation and complexity (there are 10 events within the one event) this leaves the Auckland event way behind in terms of logistics. It simply could not run without volunteers.

Paul Yeo, Manager of the Taupo District Council's Destination Lake Taupo, is in no doubt as to what the Great Lake Cycle Challenge and other activity events mean to this area. "The Cycle Challenge, Taupo International Ironman, Crater to Lake Multisports, Mighty River Fishing Competition, the Tongariro Mountain Classic, Levene Half Marathon and a host of others push Taupo to the fore again and again. They grab media attention and they bring visitors back to Taupo once they find out the sort of welcome this area hands out."

Tourism is inextricably linked to community. Anyone who has travelled knows that some of the strongest impressions you gain of a country are those of the people. I was recently in Spain. The Spanish are a very proud, passionate people and jus-

Looking for Taupo information?  
Destination Lake Taupo's website is probably the most comprehensive in the country!  
[www.laketaupo.nz](http://www.laketaupo.nz)  
Want some information on Ohakune and around the mountains?  
Try [www.ruapehunc.co.nz](http://www.ruapehunc.co.nz)



Right: Kayaking is one of the many outdoor activities to be enjoyed in the region.  
 (Photo: Destination Lake Taupo)  
 Opposite page: 2001 was a very good snow year for both the Whakapapa and Turoa skifields, both now owned by Ruapehu Alpine Lifts. The upper part of the Whakapapa skifield.  
 Inset: Enjoying a coffee at Knoll Ridge Cafe and Restaurant, the highest licensed dining facility in the country.  
 (Photos: Ruapehu Alpine Lifts)



tifiably proud of their country. Ask anyone who has been to Spain and invariably they want to return. Warm, smiling, caring and helpful - superb attributes, found every where we went. We have these same attributes in New Zealand and certainly in Taupo.

Large parts of Taupo's tourism industry would not exist without community support. Every major event from the Taupo International Ironman through to the Taupo Arts Festival are successful because of the behind the scenes and up front support and participation of volunteers. Many volunteers are members of clubs and service clubs, others just locals who want to get involved.

Anyone who has helped with any of the sporting events in the area knows the value to the athletes of the drinks stations, the transition points and how much a smile and a drink or energy means when your legs no longer want to move and every part of your body aches. I am not sure if the competitors realise how much the smile in return and a gasped 'thank you' means to those who give up their time. Support of these events makes good economic sense to a community. Tourism is worth an estimated \$222 million to the Taupo area. A significant part of that comes into the community through organised sporting and multisport events. The area grows as a result - at last count there were in excess of 220 various types of accommodation facilities available from Mangakino through Taupo to Turangi and the southern end of the lake. Talk to competitors and many intend to return. Why? Of course the scenery is spectacular but so is the hospitality. The passion and pride I encountered in Spain is alive and well in the Taupo area.

This is the International Year of the Volunteer and as it draws to a close it's worth reflecting on what a volunteer is. DOC has just released a booklet celebrating community conservation, in other words those who give up their time to assist in the conservation of New Zealand, in much the same way as thousands give their time for Taupo and other communities. I like in particular the quote by Mary Marshall from the Hawkes Bay,

"I looked up the word `volunteer' in the dictionary to make sure of the spelling and the meaning. It said `noun', so I am a noun. It also said a person who does something of their own free will, such as being a soldier instead of a conscript. So

A few Taupo facts:  
 Lake Taupo is 359 metres above sea level, 40km long, 30km wide with an area of 616 sq km.  
 Ave. yearly sunshine hours: 2002  
 Ave yearly rainfall: 1,045mm  
 Average temperatures: Summer 22.8°C  
 Winter 11.7°C



### **A few Taupo tourism facts**

- Tourism is one of New Zealand's largest and fastest growing industries and the Taupo District is an established destination for domestic and international visitors.
- Lake Taupo is one of New Zealand's largest visitor destinations, attracting over 726,000 visitors annually, including 582,000 domestic and 143,000 international visitors.
- The domestic market is approximately 78% of the total market, with the international market being 22%.
- These visitors generate over 1.484 million nights each year and the average length of stay is two nights.
- They directly spend over \$139 million each year. With downstream spending this increases to \$222 million.
- These figures include only those staying in commercial and private accommodation and in particular do not include an unknown number who frequently stay in holiday home accommodation, time-share, homestays or visit the region on day trips.
- Visitor expenditure supports an estimated 1,600 jobs in the district.
- Despite the summer peak, there is market strength through much of the year.
- Visitor activity and the industry is heavily concentrated on urban Taupo (76% of visitor related employment), and its immediate environs including Wairakei.
- There are secondary concentrations at Turangi (12% of visitor related expenditure)
- The visitor market is growing steadily - since 1996/7 it has grown 24% in visitor numbers but only 20% in visitor nights, indicating that while more people are visiting Lake Taupo they are staying less time on average. The domestic market is growing steadily whereas the international market is growing more rapidly.



One of the main drawcards to the Taupo/Tongariro area is the fishing. A quiet spot on the Tongariro River near Turangi.  
(Photo: Destination Lake Taupo)

Dave Wakelin  
Senior Community  
Relations Officer

I am also a verb, because I offer voluntarily to come forward as a volunteer. I am not the only person in this category. There are many people who have added the dimension of being a volunteer to their lives. My dimension happens to be conservation. ... To be part of this work is an extremely worthwhile and satisfying occupation. In my case I believe it is a privilege."

I love the opportunities this community offers. Involvement breeds community spirit. I believe most of those who volunteer hours and days to help out with events probably feel the same way. I feel proud to bring friends and relatives into the Taupo region and show them around. The Taupo region is part of me and in showing visitors the wonders we have on offer I am showing them part of who I am. It's a good feeling.

### Summer Time

Of course there is always the department's summer programme of guided activities if you are looking for something to do for yourself or friends this summer. This programme, now in its 38th year, provides low cost activities and trips into interesting, remote or difficult to reach parts of the conservancy. Trips are graded from one to five depending on difficulty and length and we have deliberately set out to cater for all tastes and abilities. The programme starts on 27th December 2001 and runs until 28 January 2002, picking up both the Wellington and Auckland anniversary weekends. For further details and booking please ring 07 892 3729.

If you want to find out more about the Taupo area try these contacts:

Destination Lake Taupo  
Lake Taupo Convention Bureau  
66 Paora Hapi Street, Private Bag 2005  
Taupo, New Zealand  
Telephone: +64-7-376-0400  
Facsimile: +64-7-376-0410  
E-Mail: [info@laketauponz.com](mailto:info@laketauponz.com)  
Internet: <http://www.laketauponz.com/>

Taupo Visitor Centre  
Tongariro Street, Taupo  
Telephone: +64-7-376-0027  
Facsimile: +64-7-378-9003  
E-Mail: [taupovc@laketauponz.com](mailto:taupovc@laketauponz.com)  
Turangi Visitor Centre  
Ngawaka Place, Turangi  
Telephone: +64-7-386-8999  
Facsimile: +64-7-386-0074  
E-Mail: [turangivc@laketauponz.com](mailto:turangivc@laketauponz.com)



# Volunteers

ordinary people - extraordinary contributions

Taupo tourism thrives on the efforts of thousands of volunteers







Department of Conservation  
*Te Papa Atawhai*

[www.doc.govt.nz](http://www.doc.govt.nz)





LAKE  
TAUPO  
THINK  
FRESH

[www.thinkfresh.co.nz](http://www.thinkfresh.co.nz)





Top left: Peter Morton weighs a kiwi as part of continuing monitoring for the Kiwi Recovery Programme.  
(Photo: DOC)



Top right: Tongariro Natural History Society members and DOC staff plant 15000 plants on a disturbed area near the Whanganui River headwaters following a road re-alignment.  
(Photo: John Newton)

Above: TNHS members volunteer their services on upgrading the Whakapapa Nature Walk. (Photo: TNHS)

Above right: Hut wardens on a familiarisation walk over the Tongariro Crossing. (Photo: Jimmy Johnson)

Right: Looking up the the Whangaehu Valley from the Whangaehu bridge on the Round the mountain track.  
(Photo: Laurie Burfett)





# Conservation volunteering - advanced ecotourism

In summer, an addition to the usual organised chaos around the Tongariro/Taupo Conservancy office can be observed. A mixed crowd of young people, most of them arriving bleary-eyed from the two-day flight around the world, but soon settling in, waking up and coming to terms with the New Zealand and specifically the Tur-



Vollies measuring a forest plot.  
(Photo: Steve Deverell)

angi way of life. These are the volunteers, or usually just referred to as the 'vollies'. Most of us come over from Europe to stay over the summer to assist technical support staff doing fieldwork. And many end up staying longer than initially planned. Some of us even come back several times. It is now my third time here, but hopefully not the last one.

I first discovered that the opportunity to come here existed, when I was in the middle of some serious thesis-writing, back in the early Northern Hemisphere spring of 1999. An e-mail popped up on the computer, describing the fieldwork, as 'recruitment' emails are sent to relevant departments of universities all over Europe. At the stage where I was beginning to be quite fed up with looking at the same, not very well-behaved data over and over again, it seemed to be the right time to pause and consider what my next step would be. And what could be more adventurous than, after finishing a biology degree, escaping the Danish winter, coming out to New Zealand and really getting to know the country and its famed natural resources from the inside, learning from people who know what they are talking about? The prospect of getting some field experience was an added bonus not to be ignored.

It turned out that in some ways volunteering was what I had expected, and in other ways it was completely different. The first year I took part in the forest health monitoring, which meant learning a lot of new, completely different plants, as well as getting to see a variety of forest types. Having specialised in vegetation ecology and forest ecology in particular, this was 'right up my alley', especially as the forests are certainly very different to what I am used to at home. Just the fact that there is actually some native forest left here is an eye-opener, when what you have been brought up with is essentially planted forest, though often managed in a long term perspective that to a certain extent gives room for wildlife and natural vegetation. In fact a lot of the work that is being done here is what I envisaged I would be doing when I decided to study biology. But that is the romantic and academic angle to it. Being a volunteer is also about long days in the field - and often camping out there - long walks through difficult terrain, getting cold, dirty, tired and wet, and

spending rainy days either in a tent or at the office getting on each others' nerves. Arriving here the first time was a bit of a culture shock, even though I had visited New Zealand once before. The ways were suddenly a lot more laid back than what I was used to. The dependence on circumstances that are beyond your control



Deirdre - keeping an eye on the willows.  
(Photo: Steve Deverell)

and the consequent inability to do much planning took some getting used to. But coming to terms with this and getting to know people who had a very different approach to many things, such as life in general, made me think about things and about what is important in life. When I returned home after that first summer of volunteering, I was told by several close friends that I seemed to have changed. I am sure many other volunteers have had the same experience.

Last summer as well as this season, I have been involved in some vegetation monitoring in the DOC reserves in the South Taupo Wetland just north of Turangi. This project is about developing suitable methods of controlling grey willow, which is an introduced invasive weed that is spreading into wetlands at a high rate, displacing native vegetation. As my latest plan is to supplement my biology degree with a bit of agricultural education, this project can in a way be seen as a bridge between the biology/ecology field and the weed science area of agriculture. What I hope to do is specialise in environmental weeds, and for that New Zealand is certainly (but sadly) a good place to gain practical experience.

So why volunteer? Why agree to getting wet and dirty for such long periods of time? And why would you want

to keep coming back, one would think that one time would be enough?

Actually it is not only the department that benefits from using volunteers, there's a lot in it for us volunteers, too. In Denmark, jobs in my field are rare these days, and there are a lot of people competing for them - it is an employers' market, so to speak. Anything you can do that will possibly improve your job chances - like having some practical experience from the 'real world' - is consequently an advantage. Also, volunteering provides a chance to learn something new about the things that really interest you, a chance to broaden one's professional horizon in an informal atmosphere. Maybe this fact is best appreciated once you know what it is like here. It has certainly contributed to making me want to come back.

Last, but definitely not least, it is an opportunity to travel, experience a beautiful country, and meet new people. For me this was a great treat after finishing part one of my study saga; all the fun and still all the 'sensible' reasons mentioned above to justify it.

Deirdre Husted-Andersen  
International volunteer

# A small boy's first odyssey

Wordsworth says something about "that inward eye which is the bliss of solitude".



Of course he was thinking about daffodils, not the gravelly, hilly roads of New Zealand, single speed bikes and cumbersome packs of tarpaulin tied with rope to your carrier and a 10 to 15 hour stint averaging eight miles an hour at best.

After 62 years I can still feel the road, the hill, the sweat, the trudge up yet another hill and the precarious descent down the other side with the rear wheel doing its best to go over the nearest bluff.

I think we actually enjoyed it.

If the same poet is correct and the "child is father to the man" then my continuing love of the outdoors and outdoor pursuits must have started and indeed well-bedded in from those early days.

Of course I was already nuts about swimming and surfing, but rowing, golf and trout fishing all seem a natural progression.

That and a growing concern for our wonderful environment which led to a 20-year involvement on various boards and bodies supposedly dedicated to its preservation. But more of that at a later date as my serious concerns at the continuing subtle degradation of the environment are certainly going to result in some letters to the "Editor" of a severity from which you are constrained while in office.

What happened was this - One day before Christmas 1939 - war had just been declared - my friend Wren Howard said, "Why don't we go to Tauranga/Taupo for a holiday, my brother has a bach there."

We were in Wanganui, my brother Lionel, ran a garage in Taihape.

I was nearly 15, Wren was 16. He had a three-speed bike and a racing saddle - luxury! So much easier on your arse than the broader affair on my more humble push bike. It was just as well I couldn't see the damage but you knew it was there. We didn't see another cyclist on the road the whole time we were away, now they are out in hundreds. Times have changed. 20-speed gearing, special clothing, neat little bags hanging strategically, super highways, frequent garages, restaurants, spare



tyres, water bottles. High tech indeed.

Well, parents offered no objection. They might have had they seen the roads.

I packed, facecloth, soap, towel, toothbrush, toothpaste, razor, brush, (yes I was a young shaver), two shirts, shorts, underpants (ghastly), pullover, raincoat (oilskin), enamel plate, mug, knife, fork and spoon, swimming togs (full length with skirt).

Everything was discreet in those days, nowadays it's full frontal identification.

The fateful day arrived. We set off about 9.00am and pedalled blithely onwards. To Hunterville was no problem, but after that the hills made their presence felt.

On the way we had passed Marton distinguished for its rail junction, a good china shop and some stuffy looking banks, the facades as Victorian as the managers. All good chaps with a position to hold in society and Marton society was indeed pukka. Wealthy graziers with large cars and exclusive daughters all educated at Nga Tawa whose upper crust gates we cycled respectfully past.

Grassy fields not yet succumbed to summer droughts, the ewes and lambs and fat Hereford or Aberdeen Angus cattle. The exotic breeds of today were still 20 years away. Indeed many of the pastures were new, as much of the flat lands had been cultivated for crops in the years following the depression and were only just being regressed. The lush countryside gave way to the steeper hills rolling into the distance. Their tops already brown - aerial topdressing, which transformed that, was still awaited post-war.

Little did Wren know that in 1950 he would clamber up and down similar hills topdressing them by hand.

The towering escarpments of the Rangitikei River needed a stop to admire. I had not heard of trout at that time except in connection with Taupo and famous fishing there. Little did I know that the Rangitikei was a famous river for trout and at a later date just as famous for its super-difficult rafting.

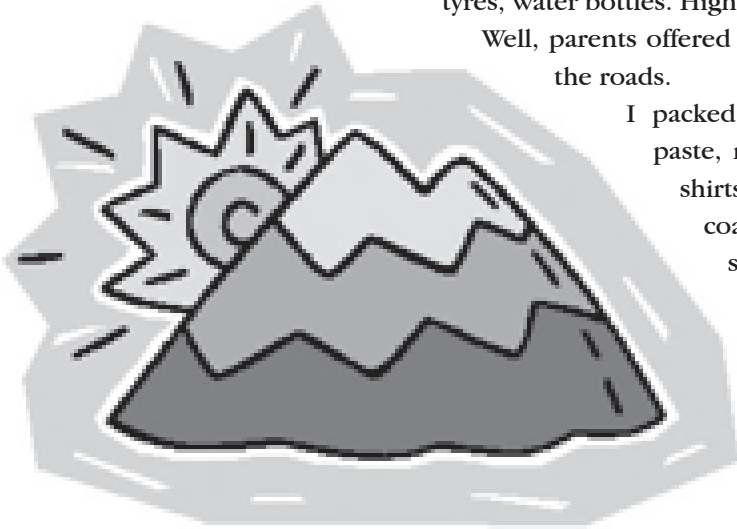
Towards Utiku the country got hillier and by that time all we could think of was rest and hopefully a cup of tea. Legs aching, bums sore, dehydrated, the sun had shone brightly all day, in those days we had summers. Nose sun burnt, in those days you usually applied remedies (none worked) after the event. Skin peeled off in large chunks and kids were sometimes bedridden from sunstroke as they called it, and like Auda Abu Tayi Sheer Bathos in his famous story of an anti climatical dawn raid. By my god, by my very god we arrived in Taihape.

Population, bugger all.

Distinguishing buildings. The Gretna Hotel and railway station. At one o'clock in the morning for the Limited and the Express trains for those pies, thick ham sandwiches (very good) and tea served in cups half an inch thick, unbreakable except by metal crushers.

Distinguished history: centre of railroad construction, boozy Saturday nights, riot act read on most of them.

Today very little has changed. Still has the feel of a remote country town like





Taumarunui. Something really New Zealand. A place for the tough-minded Kiwi. Central point for some of the best and most hardworking farmers in New Zealand, Batleys, Colliers and Roberts. Big stations, rugged country. Hard drinkers. Possum trappers, deer cullers and a Barry Crump at every lamp post. A pioneer frontier town, raw and gutsy. If it hadn't been for the main trunk line it may never have existed.

I will never forget the next day. I have never felt so drained. I even slept in the afternoon and woke up feeling in another world. However, after a good breakfast, probably bacon and eggs, the only breakfast worth thinking about.

Waiouru here we come. Only 20 miles. The worst 20 miles of the trip, all uphill (never any down) and all gravel.

Three and a half hours of slog. Six miles per hour. And Waiouru.

Well there was a song about its bleak desolation. A bloody great mountain all covered in snow. In the process of being made bleak by the army - a continuing process which has left a large area with unexploded shells, tank tracks and nothing else. But a mountain. Ruapehu. Vast, inspiring. Some snow on the peaks. A huge brooding presence. A triumph of nature.

In ancient mythology surely the home of gods Jupiter, Vulcan and Aeolus. Or Maui and his mates.

Years later I discovered the sacredness rightfully invested on it by Maori. Its dignity and mana there for all to feel. To be uplifted as are its peaks, Pare Te Tai Tonga and Te Heuheu.

Today, it belongs to all of us, and yet how easily it could have been lost to private ownership.

In 1887 such was indeed possible and we remain forever indebted to Te Heuheu Tukino IV Horonuku and his son-in-law Lawrence Grace for their wisdom and forethought in encouraging Tuwharetoa to give the peaks of Tongariro, Ngauruhoe and Ruapehu for a national park. Parts of Ruapehu are now overdeveloped and have lost their "park identity" Much is overused and subject by demands of tourism demands for further overuse and development. With the loss of direct gov-



Right: Emerald Lakes, Red Crater, Mt. Ngauruhoe and in the distance Mt. Ruapehu. (Photo: Jimmy Johnson)



The Tongariro River, world renowned for its trout fishing.  
(Photo: Dave Wakelin)

ernment by a special purpose National Park Board the park is now merely a part of the Conservation Board's activities and is suffering accordingly.

But all this was in my future. A boy of 15 had never heard of conservation, ecological riches, and politics was Labour versus National. The political parties are still there paying lip service to conservation and more concerned about mining the area for tourist gold. However the Desert Road beckoned and what a delight it was.

It was yellowy-brown clay, or sand smooth under the wheels and for us a comparative speedway, the miles whizzed by. Occasionally a car went past, leaving us smothered in fine dust and breathing through a very dirty

handkerchief. By the time we were dying of thirst and feeling like Arabs far from the nearest oasis we hit the first mountain stream. Pure bliss. We went down out of sight, stripped off and immersed ourselves in the cold water and drank gallons of it. Refreshed and sparkling we raced away. I was faster for a few hundred yards but the three-speed soon left me far behind. And then the steady descent to Turangi. Past Ngauruhoe, then Tongariro. Then the signs indicating trout pools. Major Jones, Dreadnaught, Never Fail. The names are still there but only the Major Jones identifiable.

Turangi - what there was of it - a fishing lodge and a rickety bridge over a blue clear fast flowing Tongariro. Thirty years later I landed my first Tongariro trout. Then on to the Tauranga Taupo a stream 20 yards wide at this stage flowing quietly the last few hundred yards to the lake. Lionel's cottage was a single room with bunks and stove. Outside dunny and probably a shower. Water by pump.

The lake beckoned. Wren, who could run all bloody day couldn't swim a bloody stroke. So I cruised round the warm clear water looking for trout. We never did see one.

These days of blissful existence and then Lionel and Colleen turned up and we were allowed in occasionally but slept on unoccupied verandahs. An engaged couple and she absolutely gorgeous somehow shared a car. Jack and Jill were automobiling it to paradise from the pleased smirks on their faces and their rapid disappearance after dinner.

Flight's store on the corner with the beautiful 16-year-old June. Flight to practise flirtation with.

We explored the river with its runs and rapids and fishing tracks but never an angler did we see. No boats on the lake - petrol rationing was on and the famous fishery seemed completely neglected.

Our journey home began quite dramatically. We were having some bread and butter and hot spuds at about 6pm when I opened up the communal purse and counted out exactly two shillings and elevenpence ha'penny. There was no need for words. We folded our tents (metaphorically) as we were still sleeping rough hopped on our bikes and set off for Wanganui about 140 miles away.

The first step was back down the Desert Road, north around Roto Aira and so at about 11.30 to National Park. No sign of nothing. However an abandoned car offered refuge and we slept in that until about sunrise and eventually an apple later and probably a quick crap, god knows where, set sail for Raetihi.

The going had been bloody rough with a puncture or two mended by moonlight but got progressively worse to Raetihi. Roadwork's everywhere and a great deal of walking and for two small but well educated young men an enormous amount of foul language.

I still remember the navvies and wheelbarrows in the gorge of I think the Manganui-o-Te Ao and the size of the boulders. A couple of lorries, picks, shovels, crow bars and the inevitable rough hut for the foreman. I think Sullivan was Minister of Works. He should have seen that lot. I think he was the MP who promised to get New Zealand roads up and going and publicly announced to my father's (Charlie) obvious annoyance that one navvy was worth six bankers. Where we were that day he was probably quite right. Hard yakka.

We made it to Raetihi at noon having averaged the inevitable eight miles per hour. The money which had not grown overnight bought us three meat pies with the owner discounting the purchase by the necessary half penny.

At one o'clock we set off to go down the Parapara but at the last farm on the right before the first down hill section we realised we were dying of thirst.

We turned down the farm track to the farmhouse and asked the farmer's wife for a glass of water. On asking us where we had come from and where we were going she asked us inside and sat us down to a pile of scones and hot tea. Best tea I ever had.

Fortified we set off at about two o'clock.

What a bloody long haul it was. Cycle down every hill - walk up the opposite side. We never seemed to get tired or fed up. It was new country and we even scrounged a free drink at the Kakatahi Store. I remember the bloke saying he had never seen such young boys on bikes having come so far. In those days a trip from Wanganui to Lake Taupo by car would have been a long bumpy dusty haul and here we were on bloody bikes.

Five o'clock came and went. Six o'clock ditto. And still we had miles to go.

At 7 o'clock we still had got 12 miles to go and a truck passed us, stopped, the driver got out and said, "Where have you come from?"

Swore, laughed and put our bikes in the truck - us in the cab and got us to Wanganui.

Years later I was with Bob Horsley who ran a trucking business to Raetihi etc. and I went with him to supervise some loading or ways bills and here he was, our driver. He still remembered me!

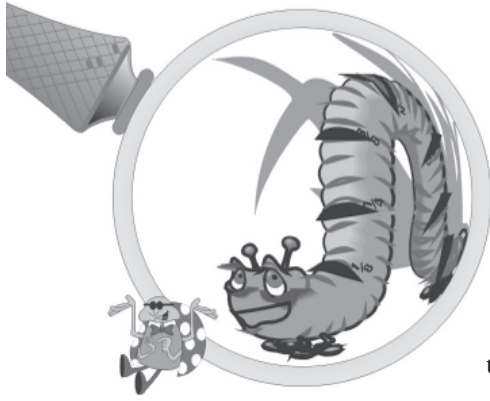
I arrived home about eight o'clock was welcomed by Ma, Pa, Shirl and Mad and Jack McKinnon. We had been away a fortnight and they had heard nothing from us and I was black with suntan and road dust. A bath - and a hot dinner and the great adventure was over.

An awful lot developed from that for which I have been very thankful.

There are still three or four of the original houses alongside the Tauranga Taupo and I think I know which one was the Howards. I see them often and the nostalgia is still there.

I am sorry Wren can't be there too.

John Ryan  
ex Tongariro/Taupo Conservation Board Chairman



## "God's Gardeners"

"Creatures like the weta evolved over thousands of years, long before predators such as cats, rats and stoats ever arrived in New Zealand. As a result they don't have natural defence systems against introduced predators. To make matters worse the techniques invertebrates developed to protect themselves against native predators such as the tuatara can often be fatal when dealing with an introduced predator such as a rat which uses sight and smell to track its prey."

Carl McGuinness, Invertebrates Protection Officer

Invertebrates have been described as "God's gardeners" because of the valuable role they play in breaking down pollutants, recycling nutrients, maintaining soil structure and pollinating plants. They are also an important food source for many birds and other animals.

### What are invertebrates?

Invertebrates are animals without a backbone. They are an extremely diverse group ranging from spiders and jellyfish through to insects and worms.

### Why conserve invertebrates?

Invertebrates are vital components of the ecosystem, helping to maintain its function by recycling nutrients and maintaining soil structure. They are an important food source for many of our native species including bats, kiwi, robins, and fantails. A number of marine species such as crayfish, kina, paua and shellfish are also a treasured food source for many New Zealanders. Many insects such as moths and flies are pollinators of plants, and are vital to the plants continued survival. All form part of a complex web of interactions and the loss of a species can have a widespread effect on the system in which it lives. Our native invertebrates help make New Zealand what it is, and without them our country would look very different.

### Why are New Zealand invertebrates so special?

Due to New Zealand's geographic isolation many of our species have evolved into unique forms. In fact the majority of our invertebrates are found nowhere else in the world. Like some of our birds, many invertebrates became large and flightless (e.g. giant weta, tussock weta and giant weevils). Because the invertebrate fauna evolved along with the rest of New Zealand's flora and fauna, they have a close association with these species and help maintain a healthy balance in the ecosystem. Other introduced invertebrate species often disrupt these associations and cannot fill the role that the native species was undertaking.

### What are the main threats to our invertebrates?

The main threats facing our invertebrates are habitat modification and predation. Introduced plants can displace our native plants, effectively reducing the habitat available to host-specific invertebrates. Introduced browsers such as deer and goats trample habitat, thin-out the under-canopy, reduce the amount of leaf litter,

"People can encourage insects into their garden by creating areas of logs or dead wood for shelter or by leaving leaf litter on the ground. If you are a bird lover, remember more insects in your garden means more birds will come to visit looking for a free lunch."

Ruud Kleinpaste  
TV 'Bugman'



The common tree weta, often targeted by the household cat.  
(Photo: DOC)



and dry out the habitat. The clearance of large tracts of native bush and scrub for urban development, rural farming, and forestry, has resulted in a number of habitats becoming greatly reduced in area, and fragmented in distribution. Fragmentation often provides barriers that prevent movement between patches of habitat. Roads or pasture may not look like much of a barrier to us, but can represent impassable tracts of hostile ground to specialised invertebrates.

Predation by introduced vertebrate species such as rats, hedgehogs, mice, and possums is a major problem. Poor natural defence systems against these predators combined with the pressures created by human activities means some species are struggling for survival.

### **How can I help?**

People can help by just thinking about their attitude to invertebrates. We often kill a spider or insect without thinking. Why? It's about a thousand times smaller than us, most of them can't hurt us, and surely we all know better than to kill something just because it looks different. Maybe killing invertebrates has just become a habit we've got into and need to train ourselves out of. If you find a spider or insect in the house that you don't want there don't kill it, just put it outside.

Taken from a DOC fact sheet on invertebrates. For more information check out [www.doc.govt.nz/](http://www.doc.govt.nz/)

### **What's in our area?**

- In the Waikato a giant tusked weta (*Momma isolata*) up to 100mm long is restricted to Middle Island in the Mercury Islands Group. A recent captive breeding programme has helped boost the numbers of this species and they have been re-introduced to two other islands in the Mercury Group.
- The Bay of Plenty is home to a large stag beetle (*Gaadoxrs aurialatus*) up to 25mm long including mandibles. Rats possums and possibly pigs pose a threat to this species. Even though *Gaadoxrs* is not in any immediate danger it is still a very impressive beetle.
- A grasshopper, *Sigauss piliferus*, is believed to have been present in all alpine areas of the North Island except for Mt. Egmont but is now thought to be restricted to the East Cape only. It is susceptible to predation by introduced predators, in particular mynah birds.
- *Powelliphanta marchanti*, a large carnivorous snail up to 54mm in diameter is found in the Tongariro/Taupo area particularly in the southern Kaimanawa Ranges. Possum predation is threatening the Kaimanawa populations.

# Volunteers help study deer impacts.

Since 1998 volunteer botanists have helped the conservancy study the impact of deer on forests. Much of the work has occurred in mountain beech (*Nothofagus solandri* var. *cliffortioides*) forest in Kaimanawa Forest Park where browsing by sika deer (*Cervus nippon*) is preventing seedling regeneration. At some sites browsing on seedlings is so severe that continuation of a complete forest canopy is unlikely after natural collapse events. Surveys using long term volunteers have measured the extent and intensity of this regeneration failure, what factors are common to critical sites and the effect of removing deer with fenced monitoring plots.

Initial analysis of 20x20m permanent plot data shows that red (*N. fusca*) and silver beech (*N. menziesii*) forest structure and composition has substantially altered in the last two decades in northern Kaimanawa Forest Park Recreational Hunting Area. Species unpalatable to deer such as *Pseudowintera colorata* (pepperwood) and *Neomyrtus pedunculata* have increased in stem density and basal area by around 50% in the overstorey (>3cm tree diameter at breast height). Sub-canopy deer palatable species such as *Griselinia littoralis*, *Coprosma tenuicaulis* and *Raukahu simplex* have declined in abundance and basal by 10-50% due to an absence of recruitment and continued natural mortality. Canopy species (*Nothofagus fusca*, *N. menziesii*, *Carpodetus serrata* and *Weinmannia racemosa*) show no significant changes in stem density or basal area. This is most likely to be because

of low current mortality rates. These conclusions are consistent with the results of concurrent exclosure plot studies in Kaimanawa Forest Park.

Early results from permanent plot surveys in southern Kaimanawa mountain beech forests (Rangitikei River remote experience zone) show that collapse and replacement is most common on small (<50m<sup>2</sup>) scales although being more conspicuous on larger scales (10 000m<sup>2</sup>). Regeneration is unlikely to be adequate on the majority of sites where plots were established in 1981. Nearly 50% of sites had canopy collapse in the 1970s, evidence of recent mountain beech regeneration is scarce. Instead dense browse resistant turf layers are slowly devel-

oping.

This work would not have been completed without the dedication of recently graduated botanists from all around the world who volunteer their time for the six month summer field season. Many of the volunteers come from European countries. They usually bring considerable skill in plant identification after classical botanical training.

Hanna Lindblom and Marie Tonnberg collecting overstorey data in a 20 by 20m permanent plot. This data describes changes in the forest canopy structure and composition using parameters of stem density and basal area.  
(Photo: Steve Deverell)



Sean Husheer  
Technical Support Officer -  
Monitoring

# Craters of the Moon Trust

Craters Of The Moon Charitable Trust was set up over 10 years ago when, following a number of car break-ins at the Craters of the Moon, a few volunteers were prepared to sit in their cars to guard those of visitors to the thermal area. For a while volunteers used a caravan, which had to be towed to and from the car park each day. Funding from the Department of Conservation enabled the construction



Above right: Craters of the Moon is boardwalked for much of the 45 minute walk to reduce the impacts of visitors on the thermal area and make the experience safer.

Below: The Huka Falls kiosk from which volunteers and paid staff dispense information and keep an eye on vehicles. (Photos: Dave Wakelin)

of the “Hole in the Wall” concrete bunker. The whole operation has progressed to the stage that we now have five trustees, two of whom work full time along with 40 volunteers. Thanks to the generosity of sponsors and donations from grateful members of the public, the Trust has been able to completely build a new kiosk as well as donate \$24,200 to the community. For the past 10½ years the kiosk has been manned every day and in that time there have been only a couple of car

break-ins. 700,000 visitors have enjoyed the delights of Craters of the Moon during this period. In April 2000 The Department Of Conservation, and The Taupo District Council, constructed a new toilet block/kiosk at the Huka Falls car park. The Craters of the Moon Trust mans this area every day along with dedicated volunteers protecting visitor’s vehicles from theft and vandalism. During that time only a couple of break-ins have been reported. 700,000 to 800,000 tourists visit Huka Falls each year.

In the main our volunteers are retired and do it for community spirit and the enjoyment of meeting and interacting with people. Our vol-





unteers put in a lot of time, providing good friendly service at The Craters Of The Moon and Huka Falls, making both sites safe and enjoyable attractions for the visitors.

Some of the organisations that have benefited from the donations received are the Heart Foundation, Cancer Society, Blind Foundation, Cancer Society, Waiora House, St John Ambulance, Riding for the Disabled, Friends of the Hospital, Salvation Army, A Treadmill for Heart Patients, Foodbank, Victim Support, IHC Lakeland Workshop, Women's Refuge and New Zealand Crippled Children Society.

The Craters Of The Moon Trust are working towards beautifying the entrance by the Kiosk, with wooden pavers or cobblestones and in the future hope to have power and telephone connections.

Eileen Munson

Craters of the Moon trustee



Right: Huka Falls attracts hundreds of thousands of visitors who view the falls from several lookout points or from one of several commercial craft operating on the Waikato River.  
(Photo: Dave Wakelin)

Craters Of The Moon is about 8km north of Taupo.

Here is a rare phenomenon where a drysteam reservoir breaks through to the surface and forms the Craters Of The Moon. These Craters are hot, noisy, restless and very much alive. It is a place of fascination where steam explodes through parboiled soils, scarring the soft, unstable earth, but where ferns, mosses and lycopods shed spores over the hot ground, colonizing and softening the hackled and broken landscape. At present there is a good walking track with wooden broadwalks and paths. This was not always so in the days of the old road and old parking area, there were no defined tracks at all, just bare patches which one followed.

Huka Falls, NZ's most visited natural attraction, 3km north of Taupo.

The largest waterfall on the Waikato River, the average daily flow over Huka Falls is 160 cubic metres per second. The unique blue colour of the water is due to the very clear water reflecting blue light. The air bubbles in the water intensify the blue colour. The falls are a magnificent sight to see.



# Hemi Kingi

"Kua hinga te tötara whakahirahira ö te wao nui ä Tane"

**A majestic Tötara from the great forest of Tane has fallen**

Hemi Kingi, Tongariro/Taupo Conservancy's Kaupapa Atawhai Manager, passed away suddenly on 9 April, 2001.

The day before he had flown back from Uluru Kata Tjuta National Park in Australia where he had spent four days at the invitation of Aboriginal leaders advising on indigenous land issues.

Hemi's health was a constant worry to his family and those who worked with him. Only days before Hemi was Master of Ceremonies at the opening of the Whakapapa Visitor Centre where he was full of the characteristic energy and enthusiasm and humour he brought to occasions like this.

Hemi worked tirelessly to build more and more bridges between iwi and DOC. Those of us who worked with him knew his sense of humour, his "By jingers!" and at some time most of us experienced one of Hemi's long and infinitely detailed reply to a simple tikanga Maori question!

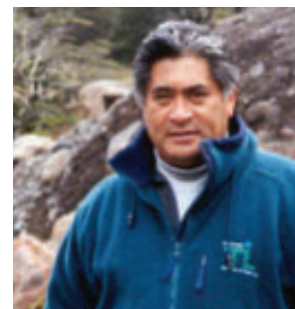
Hemi influenced many of us with his knowledge, values, friendship, fun and vision. Hemi skilfully interwove his profound knowledge of the Treaty of Waitangi as well as his grasp of the scriptures into a classically simple explanation of the two

Treaty of Waitangi scripts, one in English, the other in Maori for the department's Pukengaa Atawhai training programme. His definitions of the principles of the Treaty of Waitangi for inclusion in our Conservation Management Strategy are so defining that it likely they will be used in other plans as well.

In October/November 2000 15 countries from South East Asia/Western Pacific took part in a World Heritage workshop. Hemi's influence was immense, whether it was long discourses on indigenous land rights or leading Australians and others in song late into the night. That workshop resulted in Hemi's trip to the World Heritage Committee's meeting in Cairns last

November and the Uluru invitation just before his death. Subsequently the overseas emails spoke eloquently of the respect in which he was held.

Doug Williams, Executive Officer Willandra Lakes World Heritage Area, Australia summed up everyone's feelings; "When I spoke with him on Saturday, I opened with a bit of light-hearted banter that you would recall characterised our exchanges last year - something about it being good to see him on the right side of the ditch again. His gentle rebuke was, as usual, eloquent and wise - the gist of which was the Creator in his wisdom has put us where he sees fit and there's no right or wrong to it. It was, I suppose, his polite way of reminding me of his deep and integral attachment to his home, his knowledge, passion and love for his culture and its preservation. I am deeply sad that Hemi has passed on, but I am glad that if it had to happen it did so peacefully and under the watchful eye of his ancestor Tongariro, and not in the middle of a foreign land."



Never one to turn down a challenge Hemi took on the task of teaching the Australian World Heritage delegates to sing.  
(Photo: Dave Wakelin)

Dave Wakelin

# Peter Masters - Conservation Board chair and helicopter Pilot

Pete Masters is a well-known figure around the Tongariro/Taupo Conservancy. As well as being the current chair of the Tongariro/Taupo Conservation Board, Pete the pilot can often be seen flitting about the skies on assignment for Taupo company Helicopter Services. Pete first came to live in Taupo in 1975. He moved away for eight years during the 1980s to farm a property in the North Waikato. It was at that stage that he took up raft-guiding and subsequently worked on rivers throughout the central North Island. Pete, his wife Ali and their three children returned to the



Conservation Board Chair, Pete Masters takes time out to assist with the Native Trees in Schools project, whereby 20 sponsored trees a year are planted in each school within the conservancy. (Photo: Dave Wakelin)

Taupo region in the early 1990s.

Pete was initially approached to stand for the board by an acquaintance. Pete's astute grasp of conservation issues, wealth of knowledge about areas within the conservancy (in particular the Kaimanawa Forest Park) and practical, down to earth character were seen as qualities and attributes well suited to conservation board work. In his capacity as a pilot Pete has many dealings with concessionaires and other conservation land users – and employs this to great advantage when gathering opinions on conservation management issues. While he did not know much initially about how conservation boards operated, Pete now looks back on his time as a tenderfoot as a bonus "I had no preconceived ideas...and so went in with an open mind."

Essentially conservation boards are statutory bodies which ensure there is a community voice in conservation management. They provide advice to the department on public conservation areas, policy, activities and departmental responsibilities. There are 14 conservation boards, each with a defined geographical area, which

Safety when working around helicopters is paramount. Pete Masters devotes considerable effort into ensuring all DOC staff receive practical training and experience.  
(Photo: Dave Wakelin)



in most cases coincides with the boundaries of one of the 13 conservancies (the Chatham Islands has its own conservation board). The national equivalent of conservation boards is the New Zealand Conservation Authority (NZCA). The NZCA advises Government on conservation issues of national importance in addition to being the approval agency for conservation management strategies and national park management plans, the prime planning documents which guide the work of the department. Conservation board and NZCA members are appointed by the Government and consist of individuals independent of the Department of Conservation.

During Pete's term the Tongariro/Taupo Conservation Board has given advice to the department in areas such as: formulation of a conservancy conservation management strategy; concession applications; wildlife and plant protection; issues pertaining to the national park, conservation areas and reserves; recreational and tourism facilities; walkways; and historic and culturally important sites. The Mt. Ruapehu Crater Lake mitigation process and the Tongariro National Park Management Plan review are two significant issues presently before the board. Ensuring everybody is heard in such processes is important to Pete and he is looking forward to the management plan review as it "should produce some good healthy debate". During his time on the board Pete has learnt a lot about statutory processes and the ways in which the public can have their say in the management of conservation land. He believes that everybody has a part to play in protecting our natural environment, whether it is through direct action or through using agencies such as conservation boards to advocate for them.

The Tongariro/Taupo Conservation Board can be contacted through Rowena Cudby

C/- Department of Conservation,

Private Bag,

TURANGI

Telephone 07-386 8607, Fax 07-386 7086

Rowena Cudby  
Executive Officer



# A nation-wide search for pest fish is on.

There is a long and active history of exotic animals and plants being introduced into New Zealand. The changes made by introducing species to areas they never existed before is seen in its extreme in New Zealand. Our freshwater environment is certainly no exception, with introduced fish comprising over a third of all freshwater fish species found in New Zealand. We are no longer a primeval paradise, however we can learn from our past decisions and prevent further modification of our freshwater systems.

There are various threats to freshwater ecosystems including habitat modification and destruction, abstraction and pollution to name a few. Introduced plants and animals are an additional threat. However, some undesirable species have not completely colonised New Zealand and it is important to try and prevent them from establishing populations.

Fortunately the Tongariro/Taupo region is largely free of species such as koi carp, gambusia and rudd, the species of greatest concern. We have an array of introduced fish but thankfully, those declared 'unwanted organisms' are not thought to be present above Huka Falls. They are a problem we could certainly do without. Hence the search is on to ensure this is still the case and that it remains so.

This summer, surveys will be undertaken to determine whether pest fish species such as, koi carp, gambusia (formerly known as mosquito fish) and rudd have made it to the Tongariro/Taupo Conservancy and if they have, the extent of their distribution. We know koi carp have moved up the hydro lakes towards Lake Taupo. Preventing them from getting there is vital. This would not only cause issues for the lake but all the river systems that feed into it as well. What would happen if these species reached the lake? Would our water quality decline? How would the trout compete? Because we don't have the technology to eradicate koi from such a large water body, it is essential we restrict their access in order to avoid having to address these questions.

The survey in Tongariro/Taupo is part of a nation wide delimitation survey for pest fish. The department is undertaking the survey in order to determine how widespread these fish are. In recent years these species have increased their range and in some cases quite considerably. Koi carp and gambusia were found in the South Island for the first time last year. This was considered to be a serious internal biosecurity incursion and triggered the need for the department to more clearly define the current range of these species. When all the information is gathered the department will be able to ascertain the magnitude of the issue and an appropriate management framework will be developed.

The North Island survey team will consist of four people working their way up the North Island over the summer. They will be searching priority sites and following up on reports from the public.

## **Which species are we concerned about?**

New Zealand's freshwater systems have 38 native species and 21 species of introduced fish. Of the introduced species, eight have highly restricted distributions, two are unlikely to breed and 11 have the potential to spread and impact on a wide



variety of freshwater systems.

Like all introduced plants and animals some cause more problems than others in their new environment. Koi carp, gambusia and rudd (outside the Auckland/Waikato Fish and Game Region) are causing the greatest concern and have formal pest classifications. The distribution of catfish is also of interest, while they are widespread through the Waikato River system and Lake Taupo there are only a few other populations throughout the country. Stopping them spreading further is essential. There is a continuum of values placed upon various introduced fish. These are largely human values, which often cause debate amongst freshwater ecologists. Each species is classified under various legislation statutes according to its impact and its value as a resource. For example, salmonids, (which include trout and salmon) are classified as sports fish throughout New Zealand. They have a high recreational value and are managed as such. They do impact on native species but they are also highly valued recreationally and are economically important.

Perch, tench and rudd (Auckland/Waikato Fish & Game region only) are also classified as sports fish. Grass and silver carp are classified as a restricted species, while catfish & goldfish have no status. The group we refer to as invasive or “pest fish” are koi carp, gambusia, rudd and catfish. These are the species of most interest to DOC.

### **i) Koi Carp**

Koi carp is an ornamental strain of the common carp (*Cyprinus carpio*) native to



Koi Carp with a handheld radio for scale. Koi Carp can grow to about 75cm in length.  
(Photo: Nic Etheridge)

Asia and Europe. They were introduced to New Zealand accidentally in the 1960s as part of a goldfish consignment.

Koi carp resemble goldfish except they have two pairs of barbels (feelers) at the corners of their mouth. They are highly variable in colour, often with irregular blotchings of black, red, gold, orange or pearly white. Koi carp are long-lived fish and grow to about 75cm in length.

### **ii) Gambusia**

*Gambusia affinis* are small fish introduced to New Zealand in the 1930s from the Gulf of Mexico to control mosquito larvae but ironically, they are not very good at it! This erroneous reputation has led them to be released in many countries around the world only to become pests. They are very aggressive and will attack fish much larger than themselves. This has led to them being nicknamed “killer guppies”.

For such an aggressive fish they are not big. Mature females grow to 6 cm and males to 3.5cm. Greenish with a silvery sheen in colour, they mature at six weeks old and are unusual because they give birth to live young. This means that only one pregnant female is needed to start a new population. These features allow *Gambusia* populations to build up to large numbers very quickly.

### iii) Rudd



Rudd grow to about 250mm long and prefer ponds, lakes and slow moving streams.  
(Graphic: DOC)

Rudd were introduced illegally into the upper North Island in 1967 and spread rapidly in the Waikato-Auckland region.

Rudd are stocky, deep-bodied fish with a golden olive back, paling to silvery green on the sides. The snout and lips are a rosy-pink colour and the fins are bright red. They normally grow to 250mm long and about half a kilogram in weight. They prefer ponds, lakes and slow flowing streams.

#### Where are they found?

Koi carp prefer still waters in lakes or backwaters in rivers. They are very tolerant of poor water quality and contribute to declines in water quality.

Koi carp are widespread in Auckland and Waikato. They are spreading into Northland and they have been found in isolated places in Wanganui, Hawke's Bay and Wellington. Last year they were recorded in the Nelson region for the first time, where they were promptly eradicated.

*Gambusia* prefers the shallow margins of slow flowing ponds, wetlands and streams especially around aquatic plants. They can tolerate poor water quality and a wide range of water temperatures. *Gambusia* is widespread throughout Northland, Auckland, Waikato and Bay of Plenty. Isolated populations have been found in Hawkes Bay, Wanganui and Nelson, although eradication was attempted there. Rudd prefer ponds, lakes and slow flowing streams. They are widespread in Auckland and Waikato with isolated populations in Northland, Wanganui, Wellington and Christchurch.

#### Why are pest fish a problem?

Koi carp feed like a vacuum cleaner sucking up everything and blowing out what isn't wanted. This stirs up the bottom of ponds, lakes and rivers muddying the water and destroying native plant, fish and waterfowl habitat. Aquatic plants are dislodged in the process and are often unable to re-establish. Koi carp are opportunistic feeders, eating insects, spawn, juvenile fish of other species and diverse range of plants and organic matter.

*Gambusia* populations quickly expand to outnumber other species. They attack native fish by nipping at their fins and eyes and prey on their eggs. Whitebait and mudfish species are especially vulnerable to *Gambusia* as they inhabit similar hab-



Koi Carp can grow to formible size as this specimen shows.  
(Photo: Nic Etheridge)

itats.

Rudd eat other fish, including native species and trout, compete with them for food and can damage native fish habitat. Rudd are also a nuisance to fly-fisherman, as they will readily take a dry fly making trout even more difficult to hook.

The majority of these populations are in the Auckland, Waikato and Northland regions. They have spread extensively within these regions since 1984. Where searching has taken place in other regions a few known locations of rudd have been found in Taranaki and Wellington.

### **How are they spreading?**

Humans have, throughout recorded history, been involved in the transfer and transplantation of animals and plants for diverse purposes. Although perhaps less easily transferred than other animals, fish have for centuries been transported from country to country, and even continent to continent. The reasons for these include: aquaculture, the establishment of wild populations for recreational, commercial and subsistence fisheries, the provision of forage fishes, for biological control and for ornamen-

tal purposes.

It is not known in many cases how the introduced species came to be in the places they are found. There were certainly people who liberated species in the early days thinking it would be for the good of all. Had they known some of the effects those species would have, they would have perhaps thought about it a little harder. In the same vein there are those people who don't think of the consequences of their actions and pay no attention to the potential risks.

People are the most likely and most effective vector for fish spreading between catchments. They can spread:

- Accidentally, on boats and trailers, moving water plants and fishing gear.
- Anglers can illegally establish new populations to develop fisheries.
- Gardeners can move them around for their ponds either for ornamental reasons or thinking they will help with mosquito control. Koi carp and catfish are being sold at markets. They are also being illegally sold at garden centres and pet shops.
- 
- Many people tire of their pet goldfish when they grow to big for their bowl or pond and dispose of them in a nearby stream, thinking this will be nicer for the fish. For this reason goldfish are widespread in the wild. Goldfish are considered low risk but some other aquarium species could cause serious problems.

While pest fish are just one threat to freshwater ecosystems, they are still not

widespread throughout the country. It is important to try and prevent them from spreading further. There are few tools available to remove fish from waterways, therefore it is easier to prevent them from establishing in the first place.

It is illegal to release freshwater fish to any new waters (Conservation Act 1987). In addition the Freshwater Fisheries Regulations 1983 and the Biosecurity Act 1993 have provisions, which restrict the movement, breeding and releasing of certain species of fish.



Gambusia (*Gambusia affinis*),  
previously known as Mosquito  
Fish, grows to about 6 cm in  
length.  
(Graphic: DOC)

Unfortunately legislation alone is not sufficient to prevent the spread of species and it is essential that the awareness of the threats these species pose is understood. It can be expected that an introduced fish placed into a river or lake where it has not been before is certain to cause some disruption of existing ecosystems and to have some damaging consequences. If you do want to release fish into your pond contact your local DOC office. They will give you all the

information you need to do so safely.

### **What you can do to help?**

It remains important to ensure that any further moves to widen the ranges of introduced species are made only after careful consideration of the likely impacts and potential costs and benefits are assessed. In regards to introduced pest fish it is essential their range is not expanded at all and that we ensure they are contained to their current locations. You can help by:

- Not liberating any fish into freshwater without first obtaining the appropriate approvals.
- Wash your fishing and boating gear down at the end of the day and especially before going to a new place - encourage other anglers to do the same thing.
- If you see people releasing fish contact your local Fish and Game or Department of Conservation office as soon as possible. Take details of the person and vehicle registration.
- Encourage friends and gardeners not to spread gambusia around. Native frogs, whitebait, bullies and insects are more effective, environmentally-friendly mosquito controllers.
- Empty your aquariums into the garden, not drains or streams.

Nearly all river systems and most lakes of any size, now carry populations of introduced fishes. There are few biologically unmodified aquatic ecosystems left in New Zealand and those that remain should be left undisturbed. The protection of our waters from the invasion of alien species is possible, in practice, only if there is general public awareness of the resources at risk and a public willingness not to make releases without due consideration and proper approvals. That's where you can make the biggest contribution!

### **If you want more information**

Contact your local DOC office or check out our website; [www.doc.govt.nz](http://www.doc.govt.nz)  
(There are two links to pest fish <http://www.doc.govt.nz/cons/pests/fish.htm>, <http://www.doc.govt.nz/cons/biosecurity/fish.htm> )

Nic Etheridge  
Technical Support Officer  
Biodiversity



# Tongariro Forest Kiwi Sanctuary

Night owls Murray Potter (Massey University) and Ross Martin (DOC) have been working through the night catching and radio tagging kiwi in the Tongariro Forest Kiwi Sanctuary.

The Tongariro Forest Kiwi Sanctuary is one of five new kiwi sanctuaries in New Zealand. Increasing the number of radio-tagged kiwi in the sanctuary is essential for protecting and ultimately helping to increase the declining kiwi population.

Before night-catching, a team will spend several hours after dark listening for calls to locate kiwi. The following night Murray and Ross go in for the catch. It is cold and dark in the forest, Murray and Ross play a kiwi call out into the night, a kiwi replies. They play another call and the “thump thump thump” of an approaching territorial kiwi warns them to ready themselves. The kiwi is very suspicious of the intruder and encircles them, coming to within 5 metres.

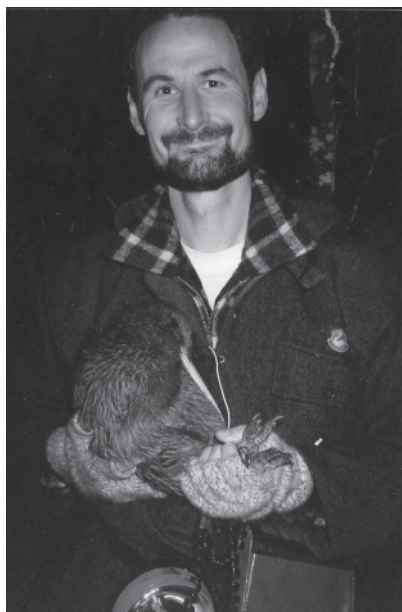
They call once more, the kiwi, now very aggravated, runs up ready to kick the intruder. Murray and Ross patiently wait, readying themselves as the kiwi comes in very close. A torch is flashed on, a well calculated grab made for the kiwi’s strong muscular legs, and success! Another kiwi has been caught. “Ice”, as she is name, is radio tagged and released back into the forest to be monitored by the Tongariro Forest Kiwi Sanctuary team.

In total 12 pairs of adult kiwi have now been caught, and are being monitored in Tongariro Forest. Staff are watching the birds closely to detect nests. When a nest is found, an infra red video camera is set up on the nest entrance to record the males nocturnal comings and goings as he incubates the eggs. Eventually kiwi chicks appear at the nest entrance, which is the cue for staff to go in at night to catch the chick and fit it with a radio transmitter.

Small, vulnerable kiwi chicks are being left in the wild this season, following the aerial 1080 operation in Tongariro Forest this year. Stoats in the forest have now been killed by 1080 after eating poisoned rat and possum carcasses. This knock down of stoats will give kiwi (and other native species) a reprieve from stoat predation this breeding season. Eventually new stoats will reinvade the forest, but it is hoped that this year’s kiwi chicks will have grown large enough to defend themselves before the stoats return.

The work in Tongariro Forest is a part of a nationwide effort to learn how to effectively control stoats over large areas of the mainland. Tongariro Forest Kiwi Sanctuary has the job of testing the effectiveness of a single large scale aerial 1080 operation. Okarito, Haast and Moehau kiwi sanctuaries are attempting to control stoats by ground trapping. The results of these various approaches will be compared, to allow the most efficient and effective technique to be established. Alongside this a major effort is going into researching new stoat control methods to add to our current trapping and poisoning techniques. One example of this research is the current Landcare experiment in Tongariro Forest, looking at the recovery of stoats and rats following the 1080 operation.

To date 12 Operation Nest Egg (ONE) kiwi have been released in Karioi Rahui, and 24 in Tongariro Forest.



Murray Potter with Te Aukaha, about to be released back into Tongariro Forest. (Photo: Amanda Smale)

Amanda Smale  
Kiwi Sanctuary worker

# Phil Smith



Maureen, Misty and Phil  
Smith at Whakapapa.  
(Photo: Warren Furner)

Phil Smith has got to be the volunteer of the millennium.

Being a Whakapapa Village resident seems to be a prerequisite to being a volunteer in all the local emergency services. Since Phil has moved to Whakapapa in 1978, he has been dragged into nearly every voluntary social organisations, such as the National Park Scouts, Whakapapa Village Social Club and the Whakapapa Village Golf Club to name a few.

His main work, however, over the years has been with the Tongariro and District Volunteer Ambulance (Whakapapa ambulance) and the Whakapapa Fire Brigade. When Tongariro National Park staff provided the safety services to the skifield in the early eighties, Phil was the backup driver of “Herbie”, a 1954 Landrover ambulance. One ambulance trip to Taumarunui included an interesting episode where one of Herbie’s wheels came off and passed Phil at Piriaka.

Herbie was eventually replaced but as the years rolled on Phil maintained his ambulance driver role with each new vehicle. Finally he was convinced to take the St. John Elementary Ambulance training. He has now become a first aider attending varying incidents in the district from asthma attacks to heart attacks, road side accidents to skifield, the life of a volunteer is never prescribed.

Recently Phil became the Whakapapa Fire Chief with the departure of the other long term resident at Whakapapa Scotty Barrie (see Tongariro 1999 Vol. 8 for Scotty's story). Phil’s new role has seen a new age of accountability for fire personnel. The paper work involved in managing this small brigade, its associated fire station and tender, highlights the need for better recognition of the input made by volunteers. All members must participate in regular training. Although it is sometimes difficult to get a full crew during the ski season a regular turnout at incidents is guaranteed by the Whakapapa brigade.

A recent car accident saw an alleged stolen car which had rolled on Highway 47. An injured patient was hiding in a drain with a mag wheel. Were it not for his moaning

from pain he could have been missed, which would have pleased him no doubt. Once found though, ever resourceful Phil was more interested in the retrieval of the mag wheel than the quivering, moaning person clinging to the tyre.

Voluntary participation in organisations such as the Whakapapa Fire Brigade has moved to another level with the advent of pagers, advanced radio communication, networked fire service computers coupled with OSH requirements. The Dad's Army type fire brigades of the past will not suffice in this new technological age. As with all voluntary involvement Phil's family have always been there to support him. His daughter Misty is now his ambulance buddy as well. His family has learned to adapt to the abnormal hours of his various callouts. They have learned to tolerate a kitchen table full of fire service paper work and his late or non-arrival at social functions.

They are continually amazed at Phil's commitment to these organisations for little or no monetary recognition, but understand his rewards are in a safer and more caring environment for people in the Central Plateau.

Good on you Phil Smith.

Maureen Smith  
Senior Finance Supervisor

After 13 years working in the conservancy, most of that time at Whakapapa, Barbara Curtis has moved to be near another mountain. She has taken up a position with the Whanganui Conservancy as Programme Manager, Community Relations at New Plymouth, under the shadow of Taranaki. Barbara, hard at work cleaning Mangatepopo Hut during a outing with Japanese Wings of Fukushima students who volunteered their time to undertake park work.

(Photo: Dave Wakelin)

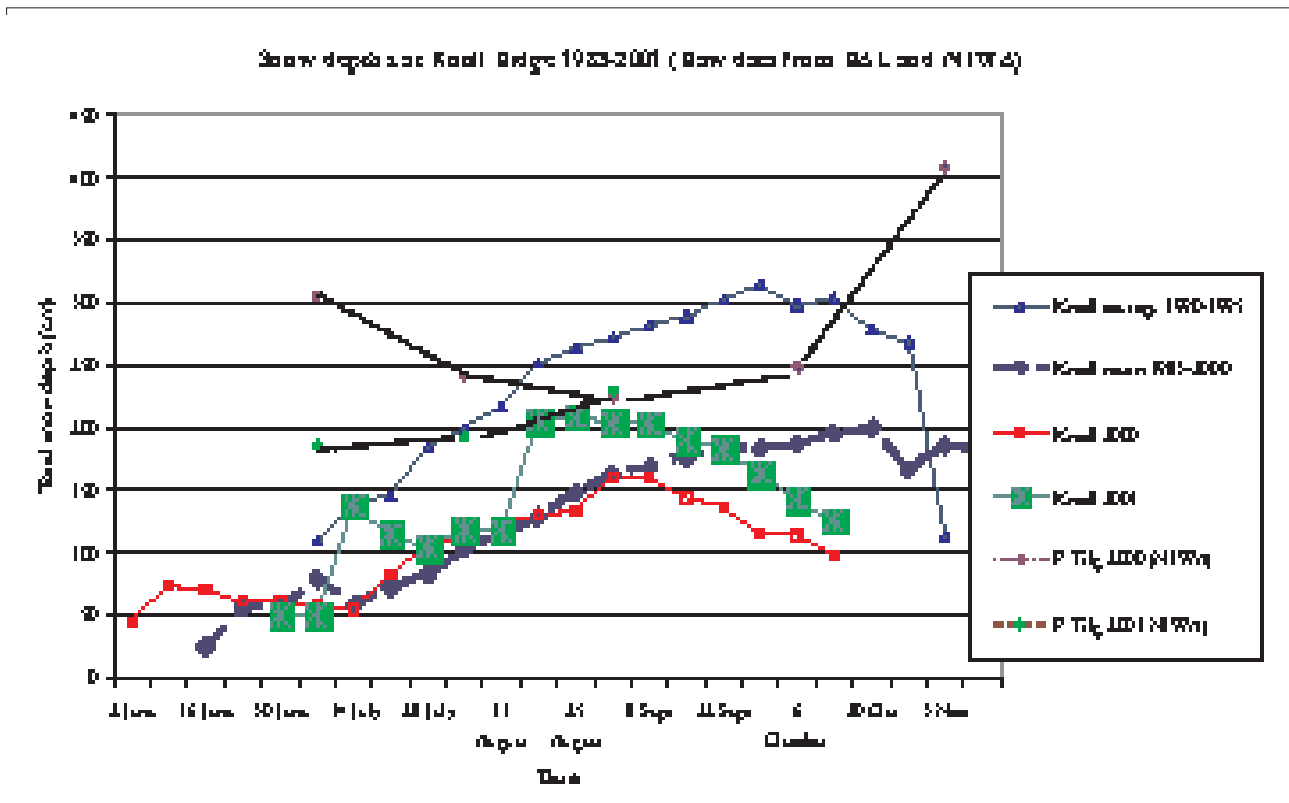


# The 2001 winter snow season on Ruapehu

The 2001 winter was a great one. The season opened at Turoa on 22 June and the last open day was 27 October (although there was still a lot of ski- and board-able snow on the upper T-bars at both RAL fields). Happy Valley opened on 23 June after excellent snow making conditions with very limited runs open in Te Heuheu Valley soon after, but the main upper parts of Whakapapa did not open until mid July. Snow cover was the thickest and most extensive since 1996 and top to bottom skiing was enjoyed for over three months at Turoa. On the John Mazey scale Whakapapa had an average (fair) season (see also graph).

The season had some interesting extremes. Snow accumulation was dominated by a few large falls (see graph). Turoa had one of the largest snowfalls ever recorded in New Zealand in mid July. The Whakapapa field just missed the main benefit of two big early snow dumps, possibly because the freezing level was too high. There were very few other significant snowfalls so without these falls it would have been a poor season. Conversely, the dominating anticyclones made for a lot of fine weather in which to enjoy the snow. This helped boost skier days significantly resulting in the highest patronage at Whakapapa since 1994.

The largest natural release avalanche recorded since 1982 occurred on 31 July near Mangaturuturu Shelter (which it missed by about 60 metres). Murray Brown estimated it had a crown wall almost 2km long and up to 4m high and was a class 4.5. The snow pack thinned faster than normal after the peak of the season due to lack of snowfall and warm spring temperatures.





## 2001 season forecast released in May 2001

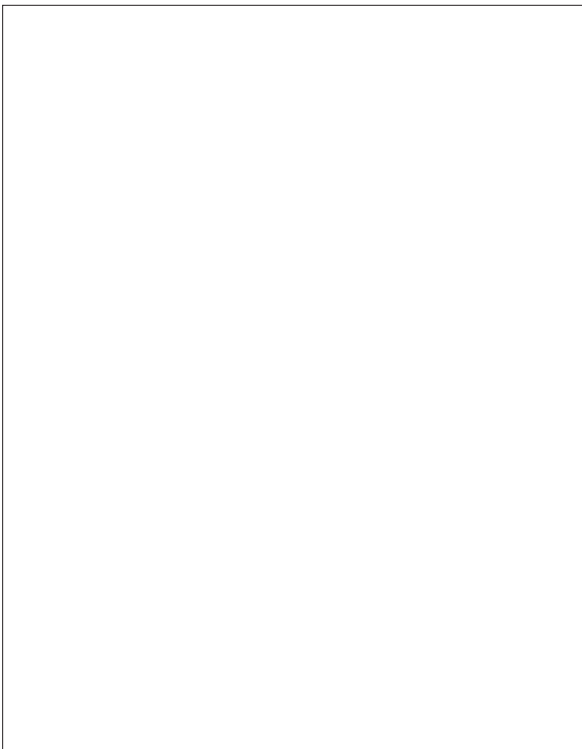
In late April 2001 a winter season forecast was developed. It noted that the Southern Oscillation Index, the main predictable influence on our weather, was still weakly positive (weak La Nina) and the general index situation was similar to 1999 and 2000. Five of the eight most widely used climate models were predicting the index to trend towards more neutral conditions sometime during the winter (June to August). Five of 11 models quoted by the Australian Bureau of Meteorology forecast that conditions will still be neutral by September. Therefore I believed the winter would most likely be similar to 2000 and there was much greater than even probability that the season would be a fair to average one.

In addition I suggested there were two factors that could result in the season being significantly better than 1999 and 2000. Surface temperatures in the tropical Pacific Ocean were looking more normal than they had in the last two years. Five of the 11 models quoted by the Australian Bureau of Meteorology forecast conditions of negative (El Nino) by September. This normally indicates that climate conditions on Ruapehu would favour more like average snow depths. In addition, some climate scientists had pointed out that the pattern in the Southern Oscillation Index between 1997 and 2001 had been remarkably similar to that between 1982 and 1986. 1986 was a better snow season (i.e. greater snow depths) on Ruapehu than 1985 and 1984 which followed a poor season in 1983 at the end of the 1982/83 El Nino. Therefore there was reasonable chance that snow depths would be somewhat greater than in 2000 and 1999. The Met Service had also forecast more snowfalls in the central North Island in 2001 than in 2000.

This optimism was offset by air temperatures and precipitation in the 2001 autumn being warmer and drier than average and being forecast by NIWA to continue that way into winter. While autumn precipitation in previous years has shown no correlation with the subsequent winter season,

low precipitation in winter correlates with poor snow seasons. Also warmer autumns have often been followed by later than average starts to the ski season on the upper mountain. However, air temperatures at Whakapapa were in fact slightly colder than average in autumn 2001 and were colder than NIWA predicted during the winter as well. However I did suggest there was a reasonable chance that a strong storm cycle would kick-start the season early as it did last year. As well it was clear that dry cold (anticyclonic) conditions would favour snow making in Happy Valley so a reasonably early start there was likely, as in fact happened.

As for the 2002 season it is too soon to start making useful predictions based on climate models. But if the season is an average one the effect of increased patronage in 2001 should carry over into 2002 and boost patronage still further.



Western side of Mt. Ruapehu showing the Whakapapa Village and the Whakapapa Skifield.  
(Photo: Mountain Air)

Harry Keys  
Conservancy Advisory  
Scientist

# TNHS - Friends of

Part of the Lord of the Rings film was shot in the Happy Valley/ Meads Wall area of the Whakapapa skifield. Hundreds of feet trampled vegetation and the film company agreed to restoration costs. Members of TNHS gave their time on an incredibly bleak day to replant the damaged areas.

(Phot: John Newton)



## Tongariro

Many who come to the “Mountain” to pursue activities such as skiing and tramping have developed a much deeper interest and love of the park’s natural history.

In 1984 a group of similarly minded people held an inaugural meeting of the Tongariro Natural History Society (TNHS). The fledgling society was endowed with a memorial fund in memory of five people, four of whom were park staff, who died on Mt. Ruapehu in a helicopter accident in December 1982.

Right from the outset the mission of the society has been to promote a wide knowledge and understanding of the natural and human history of Tongariro National Park through publications and other activities.

Over 600 volunteer hours were contributed in 2000/2001 by the Tongariro Natural History Society, also known as Friends of Tongariro, benefiting the park and other areas in the Tongariro/Taupo Conservancy. Volunteers gave their time and skills to projects like the Summer Programme, mistletoe survey and propagation and the provision of roving interpreters in the Whakapapa Visitor Centre.

While the Friends of Tongariro has been involved with conservation and public awareness projects in the central North Island over the last 16 years, this season was the first where a co-ordinated 'Volunteer Calendar' had been developed and managed. Looking to expand their programme over the coming five years, the society has agreed to raise \$500,000 for Tongariro National Park and surrounding public conservation lands. To achieve this, relationships with corporates and sponsors with an interest in the park will be formed and maintained. A large number of other opportunities exist to raise funds for conservation and public awareness. Income from its numerous publications, for example the 'The Restless Land' and 'Volcanoes of the South Wind' as well as other revenue sources will contribute to a 20% increase in income every year over the next five years.

The society is also looking to increase its membership by 30% every year until 2006

and provide opportunities for its members to come together for excursions and make their personal contributions to the park. The Tongariro/Taupo Conservator, Paul Green, sees the involvement of the wider community as vital to the future of our national parks. In paying tribute to the financial and practical contributions Society members had made to the Whakapapa Visitor Centre's re-development and to Tongariro National Park he noted that "by including a wide range of people in our work, we are not only benefiting locally through increased funds or workers but are also creating a sense of ownership and responsibility for conservation among



The society organises walks and outings into the park and other areas of New Zealand and overseas.  
(Photo: TNHS)

New Zealanders. This is important for the future of our national parks and conservation generally."

Many of the department's staff in Tongariro/Taupo have played their part in making the society's volunteer calendar a success. By providing for volunteer opportunities and managing the work they have enabled additional projects to be completed and allowed other people to become part of the department for a day.

The society helps administer a large grant to the Tongariro/Taupo Conservancy from the Jack and Emma Griffin Trust which is being used to raise kiwi chicks in captivity at Rotorua's Rainbow and Fairy Springs Kiwi House. From here the young kiwi, when large and strong enough to survive the predators of the bush, are

released back into the wild. DOC staff continue to monitor the birds' survival.

One major park project undertaken by society members along with park staff was the restoration of the old Waihohonu Hut off the Desert Road. Waihohonu Hut, built in 1904, is the oldest building in the park and has an intriguing form of insulation. The corrugated iron lined walls were filled with pumice. An inspection revealed the need for major repairs to the back and end walls of the hut as the pumice fill (300mm thick) had rotted the posts and rails causing the corrugated iron walls to start to collapse with the weight of pumice. Repair work involved saving all the pumice, replacing timbers and chimney and returning the pumice back again as insulation. The hut was painted in as near as possible the original colour with all work following advice from a conservation architect.

Two planting projects this year involved DOC and TNHS staff working together to plant thousands of plants. It took DOC staff and the TNHS a full day to plant 15000 plants on a disturbed area by the Whanganui River headwaters following a road realignment. In atrocious weather TNHS members planted out areas close to Happy Valley on Whakapapa Skifield which required restoration after filming activities by the Lord of the Rings film crew.

The society took another step during the year by appointing an executive officer to oversee projects, monitor members and carry out general administration.

The Friends of Tongariro will continue to provide funds and volunteer opportunities in the central Volcanic Plateau. The society has a database of volunteers, most of whom have indicated that they are happy for their details to be passed on to other conservation organisations. If you need to find willing workers in your area or want to find out more about this non-profit organisation, please contact Anja Hambach, the TNHS Executive Officer by e-mail [tongarironhs@hotmail.com](mailto:tongarironhs@hotmail.com) or phone 07 386 9237.

New members are welcome and membership forms are available from:

Treasurer  
Tongariro Natural History  
Society  
P O Box 238  
TURANGI.

Membership costs are Single \$20 and Family \$27.

Anja Hambach  
Executive Officer  
TNHS



# Algonquin Provincial Park, Ontario, Canada



A Moose feeding in Algonquin  
Provincial Park, Ontario, Canada.  
(Photo: Joan Gill)

I've always resented paying an entrance fee into a national park, feeling that wilderness areas belong to the people of the land, however I found myself changing my mind after the first day I spent in the Algonquin Provincial Park, approximately 250 kilometres north of Toronto.

Most of the Algonquin Park wilderness of lakes, swamp and forest is inaccessible unless you canoe or kayak. The exception is the Parkway Corridor which transects the southern section of the park for 56 kilometres. An information centre is situated at both ends of the highway and here you must purchase a C\$10.00 day permit to be displayed on the dash of your vehicle. Cheaper annual permits are also available.

I was impressed by the tidiness of the park and the system of interpretative guides allocated to each of the 13 short walking trails. Almost as soon as the loop trails leave the highway, they are encompassed by forest, mainly sugar maple on the west side of the park, and aspen or pine forest in the east. Each trail is designed to explore a different aspect of Algonquin and each has its own trail guide (interpretative booklet). Out of sight of the road, an information board provides a map and an explanation of the booklet system. This encourages visitors to borrow the trail guides for free, to enhance their enjoyment and understanding. They describe the forest, wildlife and other interesting features and may be bought at the end of the trail by putting C.37c in a special chute, or returned to be reused. The booklets are available in English, French and several other languages.

There are also three overnight backpacking loop trails, up to 88 kilometres, and a mountain bike trail, designed in four interlocking sections of differing lengths, up to 23.4km. Camping is permitted in the park at designated campsites. Of course you need a camping permit; for car, backpacking or canoe camping which must be purchased in advance.



Above: Beaver build intricate dams across streams.

Below centre: A beaver swimming across a dammed pond.

(Photos: Joan Gill)

We were day visitors, staying in a lakeside cabin 20 kilometres outside the park, and enjoyed several of the shorter trails, a visit to the Algonquin Art Gallery (another entrance charge) to view two exhibitions and the visitor centre.

The visitor centre was very impressive with its outstanding wildlife exhibits including a remarkable reconstruction of a beaver's dam, wolves, bears and moose standing in separate dioramas depicting their natural surroundings. Displays also show human involvement in the area, particularly of the logging industry. (Managed logging is still carried out in the park but in such a way that the "feel" of wilderness will

not be destroyed, and the wealth generated is the mainstay of the park region's economy.) A 12 minute video presents the human and natural history stories of the Algonquin Park. A whiteboard in the foyer invites people to list any wildlife they have seen that day. I was fascinated to see rabbits on the list, among the turtles, beavers, white tailed deer and moose. Chipmunks, although abundant in the forests weren't listed, although we saw many running up and down the trunks of the sugar maple trees. The Friends of Algonquin Park is a very active group who support the park's educational and interpretative programmes. They publish park literature, raise funds and staff the Visitor Centre and Logging Museum. Publications were extremely reasonably priced. I bought a book on trees colour and 40 pages) Of course the main visit here, is to see as natural surroundings although we made two on the Mizzy Lake trail place to view moose)



sonably priced. I of the park (a4, full for only C\$3.15.

objective of any much wildlife in as possible and evening excursions (reputedly the best we had to content

ourselves with sightings of deer, beavers and painted turtles. We were fortunate to meet some biology students from Guelph University who were studying the painted turtles. Each student patrolled an area of about 500 meters and spent a lot of time patiently waiting while being attacked by hungry giant mosquitoes. Their 'bug suits', lightweight fine mesh anoraks complete with impervious hoods, would be just the thing on our West Coast. When the turtles did emerge from the water, they slowly climbed the bank, and laboriously dug a hole in the soft sand to lay their eggs. After they covered their eggs and retreated back into the water, a very lengthy procedure, the students would mark the nest sites, remove the eggs for counting and weighing and then replace them. The eggs were small, white and had a soft leathery feel. Near the turtle hatching ground we sat on a bridge watching a large beaver patrolling his territory. But it was the moose, I wanted to see and was thrilled to see one grazing on water lily bulbs in a swamp not far from the highway. It took no notice of the hordes of tourists, cameras clicking and video recorders whirring, as it continuously dug out its favourite food.

Our time there was too short, but I enjoyed the park very much and comparing the "Friends of Algonquin Park" activities with our own 'Friends' group, I wonder if the park entrance charges subsidise their publishing and guiding activities?

Joan Gill  
Rivendell Lodge  
Fairlie

# Whakapapa Visitor Centre

Whakapapa Visitor Centre will develop a reputation, both nationally and inter-



Right: Part of the new displays in the Whakapapa Visitor Centre. Below: Reception staff now work from an expanded counter that gives them a much improved view of the display area. (Photo: Dave Wakelin)

nationally, as the cultural and volcanic centre of Tongariro National Park's unique World Heritage area that every visitor, domestic and international must see.

In an article last year Alison Rothschild, one of the Whakapapa Visitor Centre redevelopment team members, wrote this as the overriding goal the group placed before themselves.

The Whakapapa Visitor Centre is one of the Department of Conservation's largest and busiest visitor centres and the main interpretive centre for Tongariro National Park. Each year approximately 200,000 visitors walk through the doors including up to 300 educational groups. Up to 1300 visitors per day walk through the doors at the peak periods. The summer focus of the visitor is on tramping, walking and sightseeing in the park, with an estimated visitor mix of 35% national and 65% international. During the winter snow-related activities dominate with a shift to

mainly national visitors (90%).

Over the past 18 months an \$800,000 government grant has enabled the redevelopment of the visitor centre. The Ring of Fire and The Sacred Gift audio-visuals are now located in the auditorium where both have been converted to digital format. The reception counter has been relocated and a new retail area has been established. The displays, described by visitors as stunning, are entirely new.

The text and story ideas came together as conservancy staff, in consultation with iwi and others developed the themes and stories. The whole project was de-





### The Whakapapa Visitor Centre Review

The Whakapapa Visitor Centre Review, completed in 1995, identified two primary themes for the visitor centre, the gifting of the sacred peaks, which form the nucleus of the park and the dynamic volcanism of the area.

A number of recommendations came from the review, all designed to address the current and foreseeable future needs of the centre.

- The Gift Area, with the bust of Te Heuheu Tukino IV Horonuku as centrepiece, is to be left untouched
- The Ring of Fire audiovisual is to be removed, increasing the area available for displays and removing the narrow bottleneck that at present impedes visitor flow
- An upgraded Ring of Fire audiovisual will be incorporated into the main auditorium. Both the Ring of Fire and The Sacred Gift of Tongariro audiovisuals will operate from the one theatre providing the total Tongariro Experience
- Displays will be updated with some interactive components and with a greater focus on the cultural and volcanic themes of the centre
- The reception area will be relocated to a more functional position, which will provide an improved working area for staff and improve visitor-flow. This will allow an extension of retail and visitor information areas.

signed and overseen by Janet Bathgate of Janet Bathgate Design. Rick Edmonds has produced the murals and three-dimensional models while Tony Lilleby of Cognita New Zealand Ltd. was responsible for the revamped audiovisuals.

The years of planning, redesign and technical expertise came to fruition in March 2001 when approximately 100 gathered outside the visitor centre in perfect weather conditions for the opening. The ceremony began with a powhiri involving Ngati Tuwharetoa and Ngati Rangī, both of whom have strong spiritual and ancestral links to the mountains of Tongariro National Park.

The Minister of Conservation, Sandra Lee, noted that, "Well designed and present-ed visitor centres are the gateways to our national parks and other cultural and

Ngati Tuwharetoa paramount chief Tumu te Heuheu, DOC's Director Hugh Logan, Minister of Conservation Sandra Lee and John Tahuparae of Ngati Rangī take lessons from Melinda Bozawa of Matamata on how easy it is to learn about volcanoes at the redeveloped Whakapapa Visitor Centre.

(Photo: Dave Wakelin)



scenic jewels. No other departmental facility prepares the visitor for their park experience more effectively, or presents such strong conservation messages. This visitor centre's purpose is to introduce visitors to the wonderful natural areas that surround us and to inform them of the big conservation challenges facing us in the central North Island."

John Tahuparae of Ngati Rangī and Ngati Tuwharetoa Paramount Chief, Tumu te Heuheu both spoke of the strong spiritual ties their iwi have with the mountains. They acknowledged the significance of the visitor centre's displays and audiovisuals in presenting and preserving that association.

The department's Director General, Hugh Logan, saw Whakapapa Visitor Centre as the flagship visitor centre attracting more than 200,000 visitors through the doors each year.

Conservator, Paul Green, paid tribute to the Tongariro Natural History Society whose financial and practical contributions underlined the community spirit that has been part of the visitor centre's redevelopment.

Eight months on, as the visitor centre prepares itself for a busy summer, Alison Rothschild, the visitor centre's manager is pleased with the way everything has worked. There have been a few hiccups as one might expect she says but the use of the centre by schools groups and general visitors alike has been pleasing, with comments coming back to reception staff that indicate the enthusiasm everyone has for the finished product.

Dave Wakelin  
Senior Community  
Relations Officer

Below: Conservation Corps workers recently carried out some great track work on the Whakamoenga Pt. and Ariatiaia Rapids lookout tracks.  
Below right: The Corps hard at work on the Whakamoenga Point track.  
(Photos: Shane Littlewood)



# Monitoring tomtits in Tongariro Forest

You may wonder why tomtits are of interest within this area at present? The current tomtit work actually stems from management of the slightly more charismatic and endangered North Island brown kiwi. Part of the Tongariro Forest Kiwi Sanctuary programme for this winter is to monitor the fate of kiwi during a 20,000ha aerial 1080 possum control operation. An operation of such large scale in a relatively accessible situation also provides a great opportunity for other research.



Not only are kiwi sanctuary staff looking at kiwi survival, Landcare Research Manaa-ki Whenua will be monitoring long term trends in rodent and stoat density following the poison operation, and the tomtit work is tagging along for the ride as well! Tomtits are small insectivorous birds which forage for insects ranging from those on the ground to those up in the canopy. It has been documented from a number of previous aerial 1080 possum control operations that tomtits are one of the more vulnerable non-target species. Detailed monitoring is therefore needed to determine the impact of such poison operations on tomtit populations, both during a poison operation, and for the following one to three years.

Monitoring non-target impacts of pest control is nothing new. The difference with the tomtit monitoring at Tongariro this winter is its importance for both managers and researchers. DOC Science and Research staff, Ian Westbrooke (statistician) and Ralph Powlesland (forest bird ecologist), saw this as an ideal opportunity to compare two monitoring techniques - 'Distance Sampling' and 'Territory Sampling' - focusing on their respective practicalities for use as monitoring tools.

Distance sampling refers to a suite of methods that estimates the absolute density of a population. In the case of the tomtit project it is based on accurate distance measurements of all tomtits heard and seen on or near a transect line. Territory sampling involves catching and banding birds in known territories, then re-visiting the territories after the poison operation to see how many of the banded birds are alive. We suspect the later is more time-consuming, however, it's time to quantify the costs and benefits of each, and compare their respective results. The outcomes we hope to achieve from this work are:

- To get an estimate of tomtit abundance before and after the 1080 drop using distance sampling and territory sampling.

Above right: A Tomtit is examined for its band.  
Below: Nic Etheridge with a calling device to attract Tomtits.  
(Photos: Nic Etheridge)







Mist netting is deployed to catch Tomtits.  
(Photo: Nic Etheridge)

Nic Etheridge  
Technical Support Officer -  
Biodiversity

- To determine the impact of the 1080 drop on the tomtit population by comparing the results of the two monitoring techniques.
- To establish a current best practice for the use of distance sampling and territory sampling for managers.
- To gain comparative management guidelines for territory sampling and distance sampling .
- And lastly we would like to investigate the recovery rate of the Tongariro tomtit population after the 1080 drop.

The Tongariro project provides ideal opportunities for both managers and researchers. Biodiversity managers will gain detailed results about the impact of the 1080 operation on a variety of target and non-target species. Similarly, DOC Science and Research staff will be able to answer questions regarding effective monitoring techniques by piggy backing on the resources already allocated for a large scale pest control operation. It's called 'efficiency'!

At present managers and researchers are in the preparation phase of the project. Those involved in the tomtit project have undertaken a pilot study for the distance sampling, and are now catching and banding birds for the territory sampling comparison. The really exciting time will be soon after the 1080 drop, when we expect to get answers to some of those burning questions!

Initial indications from both resighting of banded male tomtits and distance sampling indexes of populations show little if any impact from the 1080 drop on the tomtits monitored at the study sites.

Further, we anticipate that statistical analysis of the results, which we will be carrying out over the next two months, will demonstrate that the results rule out any sort of crash in the monitored population.

## Technology for Country Folk

The following is a set of definitions of technology terms for Country folk...

LOG ON: Making a wood stove hot

LOG OFF: Too much wood on fire

DOWN LOAD: Gitten the farwood off'n the truck

MEGA HERTZ: When yer not keerfull gitten the farwood

FLOPPY DISC: Whatcha git from tryin to tote too much farwood

RAM: That thar thang what splits the farwood

HARD DRIVE: Gitten home in the winter time

WINDOWS: Whut to shut when its cold outside

CHIP: Munchies fer the TV

MODEM: Whatcha do to the hay fields

KEYBOARD: Whar you hang the dang truck keys

MOUSE: What eats the grain in the barn

MOUSE PAD: That's hippie talk fer where the mouse lives

REBOOT: Whut you have to do right before bedtime, when you have to go to the outhouse

# SUMMER PROGRAMME

## Guided Activities

27 December 2001 - 28 January 2002

The Department  
of Conservation's  
Tongariro Taupo  
Summer Programme



**Discover** the real wonder and beauty of the Central North Island.

**Experience** the delights and treasures of Tongariro National Park, a dual World Heritage area, Kaimanawa Forest Park, Lake Taupo Reserves and Tongariro Forest with DOC staff and volunteers.

**Explore** the fascinating underground life in a cave and hidden valleys.

**Feel** the aura and serenity of our forests and streams.

**Share** in the excitement of scaling a volcanic peak, heli-hiking or finding glimpses of our past.

**Phone 07 892 3729**  
**for more information**



Department of Conservation  
*Te Papa Atawhai*

**Want to get blown away?**

Visit the newly renovated Whakapapa Visitor Centre, the cultural and volcanic centre for Tongariro National Park, dual World Heritage area.

- Track, weather and park information
- hut tickets and Taupo fishing licences
- new multimedia audiovisuals and displays
- conservation retail shop

State Highway 48, Whakapapa Village, Mt. Ruapehu 2650, NZ  
Phone: 07 892 3729 Fax: 07 892 381  
email: whakapapavc@doc.govt.nz

**Where Does That Trip Start From?**

Our summer programme guided walks start from a variety of locations. Read this brochure or ring 07 892 3729 for more detail.

**Crater Cruise**  
Kaimanawa Secrets  
Kawakawa Bay  
Eco-Kayak Explorer  
Taupo Volcano Tour  
Wilderness Watercolours

**Lake Taupo**  
Taupo Fishing Seminars

**Taupo**  
Wilderness Watercolours  
Boyd/Oamaru

**Tauranga**  
Grand Tourist Route  
Mt. Pihanga  
Mt. Tihia Views  
Tauranga-Taupo Waterfall  
Tongariro Crossing  
Waihoanou-Tama Wander  
Whangaehu Lahar Path

**Whakapapa Visitor Centre**  
Tongariro National Park

**Waipakihī**  
Helihike

**Alpine Flowers**  
Evening Talks  
Explore a Forest  
Okupata Caves  
Park Awareness Day  
Pinnacle Ridge  
Puke-Tama Challenge  
Summit Adventure  
Tama Lakes Loop  
The Last Survivors  
Tongariro Crossing  
What's in a Stream?

**Alpine Explorer**  
Kaka Tracking  
Karo Rahui Hikoi  
Kiwi Encounters  
Mangatururu Headwaters  
Raetihi Hill  
Saving NZ Mistletoe



